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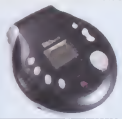

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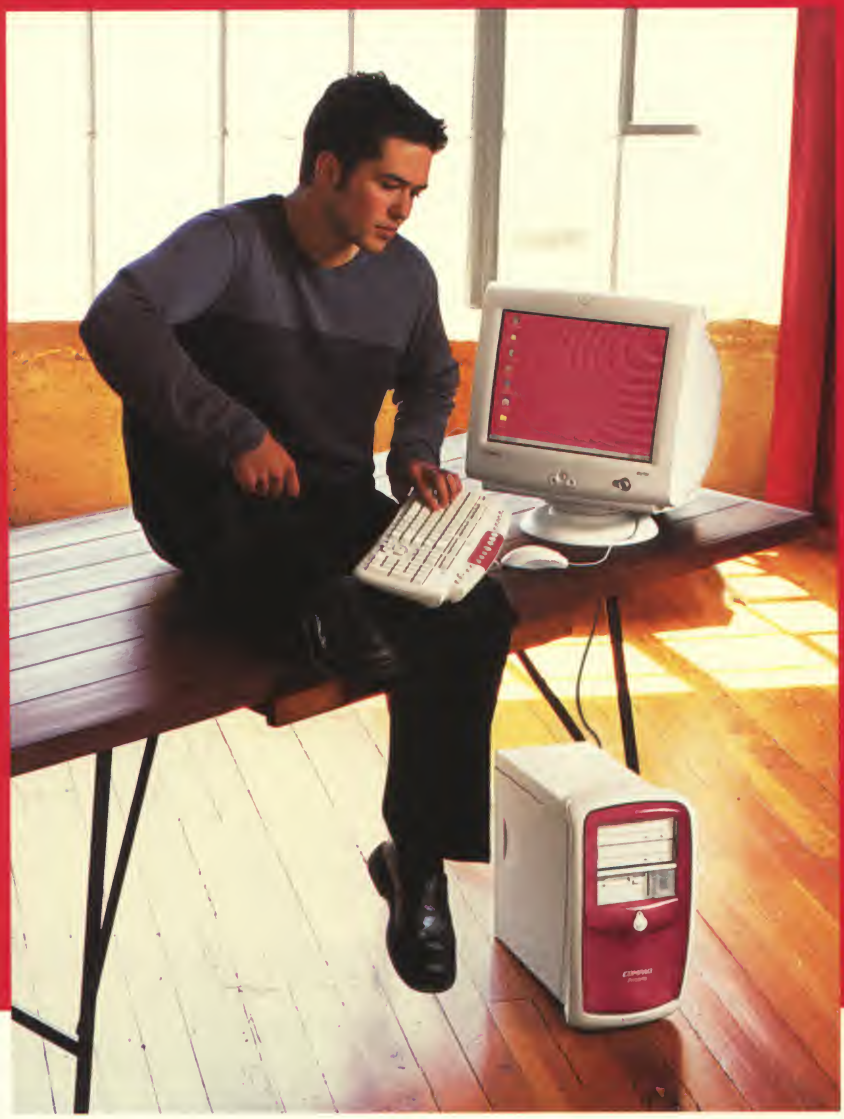

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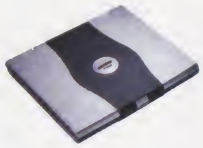

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from the editor

JANICE CHEN

The Fastest Face Off

Lately, it seems that readers shopping for a new desktop PC have their eyes—and wallets—on one of two types: budget or bleeding-edge. Last month we explored the options for the thrifty; this month we take a look at the latest systems for the power-hungry.

The race for speed between Intel and AMD is nothing new. But check out our feature "Clash of the CPUs," and you'll see that the two rivals have unleashed innovative processor architectures that yield solid performance gains. To find out which is fastest, we tested five systems powered by the latest Athlon XP and Pentium 4 engines. Not only are these powerhouses blazingly fast, they're also fully loaded with high-end components including cutting-edge graphics cards, recordable DVD drives, and superspacious hard drives. You'll find the results of our speed trials on p. 94.

These systems all deliver eyebrow-lifting power for performance-driven applications like 3D games. But those interested primarily in white-knuckle action need not drop several thousand dollars to get great gaming. A better option is to invest a couple hundred in one of a new breed of gaming consoles, which deliver spectacular performance at a fraction of the price of a gaming PC. The three top contenders—Microsoft Xbox, Nintendo GameCube, and Sony PlayStation 2—pump out stunning graphics and come packed with advanced features such as muscular processors and DVD and CD playback. To determine which console suits your gaming style, see "Top of Your Game" on p. 108.

If you're more audio than visual, you're probably anxious to hear advice on MP3 players. That's because the boom in form factors has made settling on a device that meets your needs increasingly complex. You now must consider a wide range of model types—including flash-ROM-based, hard-drive-based, multiformat CD, and MiniDisc—as well as price and functionality. Our Shopper's Guide to Digital Audio Players (p. 122) will help you decide which device best enables you to manage your music.

And those who want to manipulate their digital photos will want to check out "Image Makers" (p. 128), where we put our hands—and eyes—on four image editors that are highly capable without being wildly complex. They pack a friendly interface, automated image-repair features, and even text and drawing tools, for as little as $55.

You'll probably end up storing all those picture-perfect images on your hard drive, and that can be risky. Drives do fail, and, if you're like most of us, you don't back up. "CD-RW to the Rescue" (p. 158) walks you through the process of safeguarding your data in either full or incremental backups. It's a lot easier than you think, and it can prevent hours of aggravation when disaster strikes.

Of course, computer crises can't always be contained to your hard drive, which is why you should plan ahead to make tech support easy and effective. Practical preparation and record-keeping will prime you for that inevitable tech-support call. And if you're a do-it-yourselfer, you can get your PC up and running again by scouring knowledge bases and interactive PC-support Web sites. The data is in the details, which you'll find in "Service...*Please!*" on p. 116.

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PRIVACY IS 'PRICELESS'

In your February Trends article "No Profit in Privacy?" (p. 20), John Pescatore, vice president and research director of network security at Gartner, states only two classes of user need pay for anonymity: "criminal elements and perverts."

I'm certain the thousands who signed up for Lindows.com's mailing list wished they'd used some sort of anonymity when they learned a Microsoft lawsuit required the company to turn over to Microsoft all the e-mail addresses and messages sent to that list. *[Lindows.com's LindowsOS is a new*

No Profit in Privacy?

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operating system that runs both Linux and Windows software. —Ed.] I wouldn't consider those people part of a criminal element or perverts.

The larger problem with paying for anonymity is those who want to discover an individual's identity can do so by tracing a credit-card number or personal check; either one will point the way back to whoever paid for the "anonymous" account. For true anonymity on the Internet, only a free system can be trusted.

Steve De Rose

CONSUMABLE PRINTER

I'm beginning to wonder if we aren't entering a throwaway-printer market. I do most of my shopping online or at Wal-Mart. While picking up a pair of cartridges for my Epson printer (one black and one color), I discovered that for $5 more, I could buy a brand-new Epson inkjet printer with one black and one color cartridge. I came very close to just getting a new printer and entering a throwaway lifestyle, rather than paying the ridiculous price for just the cartridges.

F. Ray Knight, Jr.

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EASY ON INTERNET EXPLORER

After reading your feature on CD-writer software in the February issue ("Disc Masters," p. 128), I noticed one issue you never brought up and may not have been aware of. When I bought my CD-RW drive, the OEM version of Adaptec's [now Roxio's] Easy CD Creator that came with the drive refused to install until I loaded Microsoft Internet Explorer. I had extracted Internet Explorer from Windows 98 using the 98Lite utility.

I would suggest you add an entry to the system-requirements list for those programs that require Internet Explorer or other such software. As for myself, I avoid any applications that require Internet Explorer or other nonstandard components.

James LaBarre

Roxio says previous versions of Easy CD Creator required Internet Explorer, but it's no longer required in version 5.0 and later. —Ed.

CORRECTION

The March "Hard Edge" column (p. 160) misidentified the Segway Human Transporter inventor's first name. The inventor is Dean Kamen.

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We examine five sub-$1,300 notebooks that deliver impressive performance and some cutting-edge technology, too.

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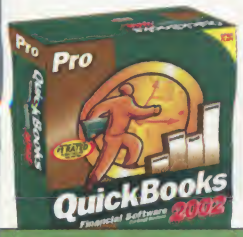

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TRENDS

Apple's New Designs for The Digital Home

Apple Computer *(www.apple.com)* rang in the New Year with a flurry of announcements aimed at cementing its place as a hub for consumer digital devices. Topping off the news from Cupertino was the unveiling of the redesigned iMac, the updating of Mac OS X to support more peripherals, and the launching of the iPhoto digital file-storage and -manipulation system.

The revamped iMac captured the lion's share of the attention for its innovative appearance, with reactions varying from wild praise to dismissive comparisons to a desk lamp. The new design features a 15-inch flat-panel display connected to a dome base with a pivoting arm, five USB ports, and two IEEE 1394 (FireWire) ports.

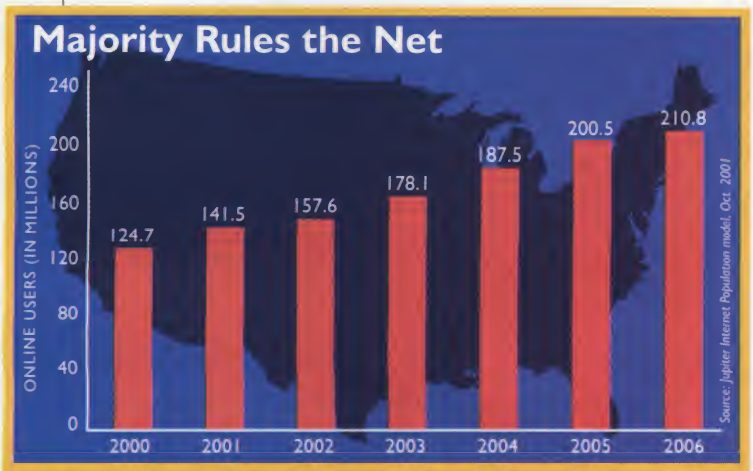
Three new iMacs will be available this spring. The $1,299 entry-level model is based on a 700MHz PowerPC G4 processor, 128MB of RAM, a 40GB hard drive, and a CD-RW drive. For $200 more, consumers can purchase a model with 256MB of RAM and a combo DVD/CD-RW drive. The top-of-the-line version sells for $1,799 and is powered by an 800MHz G4 processor, a 60GB hard drive, and a SuperDrive DVD-R/CD-RW drive.

All Macs now ship with the latest version of OS X. Version 10.1.2 adds support for more peripherals, including devices with USB and IEEE 1394 connections, notably digital cameras and camcorders. It also increases support for PC Card-based storage devices, such as media readers, that are useful for transferring data between digital cameras and laptops.

Rounding out the announcements, iPhoto follows in the footsteps of iMovie and iTunes, programs that store, edit, and organize digital movie and music files, respectively. iPhoto does the same for digital images, while retaining the elegantly straightforward iTunes interface.

Still, it's too early to crown Apple the king of the digital home. Stephen Baker, an NPD Intelect analyst, believes the digital-hub concept is still in its infancy, and says Apple has a way to go before it can claim the mantle of leadership.

"Apple, consumer-electronics companies, and the IT world all have visions of what will work as a digital hub, and everybody's is different," Baker observes. "These things will be sorting themselves out for a while." —*Jon Halpin*



The digital divide still exists, but signs indicate it may be shrinking. According to Jupiter Media Metrix, more than half of the U.S. population, about 157 million people, will log on to the Internet at some point in 2002. Not all of these users will log on via home PCs, however; some will access the Net at work or a friend's house. Still, by 2005, more than two-thirds of the population will be online.

Palm's Wireless Wake-Up Plan

Palm *(www.palm.com)* dominates the handheld-organizer market, but in the last year many mobile professionals have opted for the wireless e-mail capabilities of **RIM's** BlackBerry wireless organizers. Now, Palm has its own wireless organizer that will let you fetch your company e-mail from your car, bed, or just about anywhere else.

The new $449 Palm i705 delivers an always-on wireless connection to the Internet and your corporate e-mail. A "pushed e-mail" feature lets you receive e-mail on your Palm as soon as it's available, rather than only when you check for new mail. The device also comes with 8MB of memory, a Secure Digital expansion slot, and the standard 160-by-160-pixel display. Unlike the BlackBerry, the i705 does not have an integrated keyboard, but Palm will offer add-on keyboards separately.

To use the i705's wireless e-mail features, you must subscribe to one of **Palm.Net's** service plans. Prices range from $19.99 to $39.99 a month, depending on how many messages you send.

Palm i705

The release of the *i705* was made possible, in part, by Palm's acquisition of **ThinAirApps,** a company that specializes in secure wireless-access software. With ThinAir Server installed behind a corporate firewall, authorized users can send and receive e-mail from their company's intranet wirelessly on their PDAs, rather than using a desktop computer and virtual private network. —*Kevin Savetz*

TRENDS

DataPlay's New Spin on the CD

A new optical-disc format is set to challenge the ubiquity of the compact disc. With its release in April, **DataPlay** *(www.dataplay.com)* is positioning itself as a universal storage option for computer users and the delivery format of choice for music labels and other media companies, complete with digital-rights-management (DRM) features.

Todd Oseth, senior vice president, says DataPlay's long-term goal is to become the pervasive mobile removable-media option by tackling the two areas that are the bastion of CDs. "What made CDs popular is music, what made it a mainstay is computing," he says.

DataPlay discs are just larger than a quarter, with recordable versions available in 250MB single-sided and 500MB double-sided capacities. **Evolution Technologies** *(www.nowevolution.com)* plans to release the first DataPlay-enabled digital audio player in April, with blank discs expected to be available at the same time. Just as important, a diverse group of music companies, including **Universal Music Group, EMI Group,** and **BMG,** will also be issuing prerecorded releases on DataPlay in the second quarter of this year.

DataPlay disc

According to Oseth, the company strived to strike a comfortable balance between the desires of both content providers and consumers. "Content owners have the right to make copies," Oseth says. "But we also want asset owners not to have to worry about piracy."

Ryan Jones, a Yankee Group analyst, says the DRM features will be extremely important for DataPlay's acceptance by media companies. "[Such features] are the only reason record labels have for accepting the format," he says.

With the proliferation of CD burners and free music downloads, media companies are trying to stem the tide by locking up the content they release. In December, Universal released one of the first copy-protected CD in the United States, *More Fast and Furious,* a follow-up to the soundtrack of the movie *The Fast and the Furious.*

Still, copy-protected CDs look to be a difficult sell. Jones notes that too many operational glitches disrupt normal consumer use. "They're trying to find a solution and make it backward-compatible with players that were never intended to handle it," he says.

—Jon Halpin

Helmet Cam Offers Virtual First-Person Pictorial Tours

Imagine planning your next golf trip by visiting the course's enhanced I-Vues Web page and taking a shot-for-shot visual tour, complete with 360-degree and aerial views of each hole. If Michael Jones' vision comes true, that fantasy will soon become a reality.

Jones, president and CEO of **Niche** *(www.i-vues.com)*, has two patents for innovations. The first is described above; the second is a wearable, hands-free, lipstick-size video camera that integrates wireless audio/visual transmissions, two-way radio communications, and recording technology. Jones says his minicamera can be used as a teaching tool.

"Coaches can use it to train skiers, mountain bikers, kayakers, and other athletes," he says. "They can stand on the side of the mountain, river, or hockey rink and use the equipment to see and hear everything from the athlete's perspective."

Although the camera's applications are now driven largely by sports and leisure, Jones envisions additional uses. A fire department could use it to provide training sessions on approaching buildings, or a security guard outfitted with the camera could walk through a ship or building while supervisors view what the guard is seeing via a wireless transmitter to evaluate where safety measures need shoring up.

The basic helmet-cam unit will sell for about $275 and work with any videotape-recording device. A complete system that includes a recorder, microphones, handheld controls, and LCD monitor is expected to cost between $1,500 and $2,000.

—Ellen Ullman

Rhode Island First With Enhanced 911

Rhode Islanders received an early holiday gift when, on December 24, their state became the first to roll out statewide enhanced 911 coverage. So-called "e911" services allow police and fire departments to pinpoint the location of a cell phone used to place an emergency call.

Although the technology is in place, not all cellular users in Rhode Island will benefit because some phones don't support the service. **Sprint PCS** *(www.sprintpcs.com)* set up the e911 system using a Global Positioning System (GPS) strategy. Sprint phones are manufactured by **Samsung Electronics** and come equipped with GPS chips and network-based enhancements.

Jim Goerke, wireless implementation director at the **National Emergency Number Association,** sees Sprint's coverage of Rhode Island as the beginning of a slow rollout by the major carriers. "It will take the better part of two years for any kind of ubiquitous coverage," he says.

Given that the **FCC's** original deadline for cellular-communications companies to set up nationwide location services was September 2001, Rhode Island's belated rollout is something of a disappointment for public-safety organizations. The FCC recently extended the deadline another five years to allow carriers sufficient time to deploy the service fully.

Rhode Island joins a small coterie of locations with e911 service, including St. Clair County, Ill., and Lake County, Ind.

Carriers have two alternatives in setting up location services: a network-based system or a GPS-based one. The former uses triangulation from nearby cell towers to locate a caller; the latter relies on GPS chips in handsets.

—J.H.

SECTION CONTINUES ON PAGE 26

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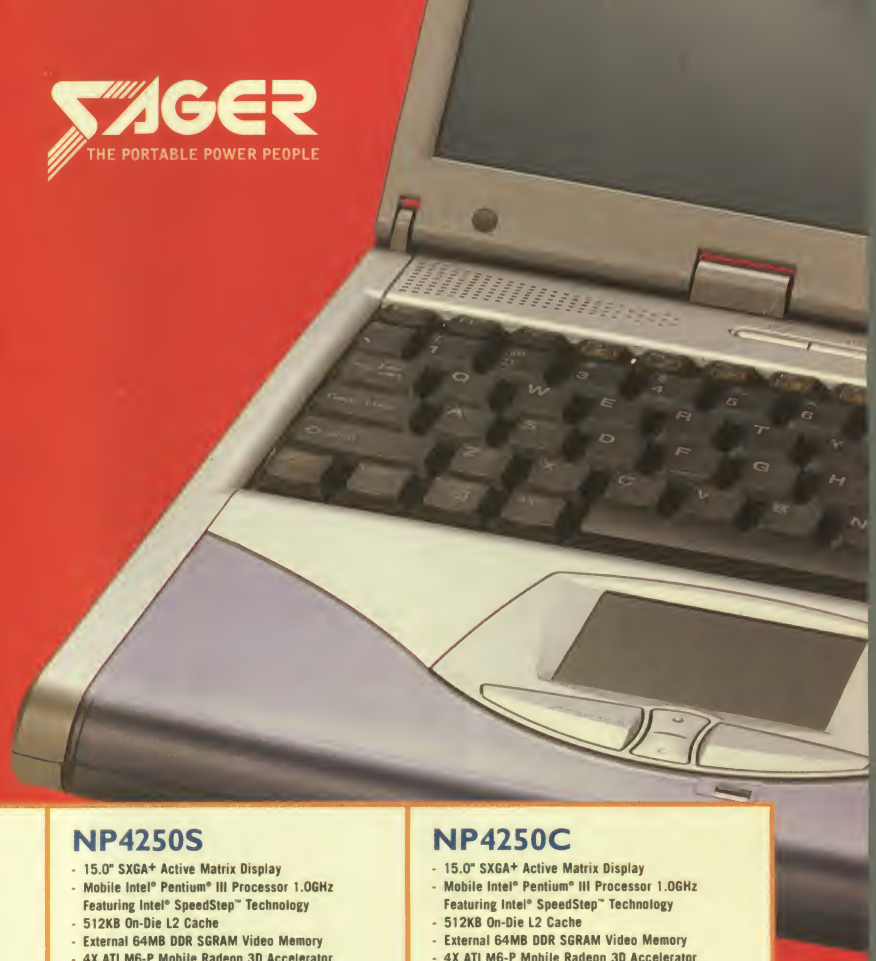

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TRENDS

New Software Screens for Stolen Property

Unsavory characters looking to unload some hot merchandise for a quick buck best not take it to Vancouver. The Vancouver, B.C., police department has teamed up with **XML Global Technologies** ***(www.xmlglobal.com)*** to create Xtract, a stolen-property database that links pawn shops, which frequently receive stolen goods, with law enforcement.

Whenever someone sells an item to a pawnshop or secondhand store, the pawn broker enters information about the object into Xtract via a Web site. The XML-based software compares the item to a database of stolen property. If it finds a match, law enforcement is immediately notified by e-mail or pager. In addition, police officers can search the database to identify found property.

Vancouver is the first police department to use the system, and XML Global is now offering it to other law-enforcement agencies in the United States and Canada.

"As the program rolls out, we can interlink the stolen-property databases," says Matthew MacKenzie, XML Global's vice president of research and development. "If someone steals something in Portland and then goes to Vancouver to unload their booty, the software will find it." The Vancouver police department estimates they will increase the amount of recovered property by 300 percent.

ILLUSTRATIONS BY BEK SHAKIROV

In the past, stolen-property recovery was agonizingly low-tech: Secondhand and pawn shops were required to file reports by fax, which meant easy falsification of data and slow searches through file cabinets for police.

"If this product can help increase the amount of stolen property recovered, everyone will be happier—except the criminals," MacKenzie says.

—Kevin Savetz

A Safer Way To Pay Online

Many of us can't live without credit cards, although millions still refuse to use them online. Nonetheless, merchants are eager to sell to these reluctant shoppers.

One possible solution may be **Western Union MoneyZap** ***(www.moneyzap.com)***, which lets you pay for online purchases using a direct transfer from an existing checking account. You first register at a participating merchant site, then verify the purchase amount and enter your name and password.

Sound familiar? Elaine Bolle, president and CEO of **Achex,** the company that runs MoneyZap, says although it offers some of the same capabilities as person-to-person payment systems such as **PayPal** ***(www.paypal.com)***, MoneyZap focuses on merchant business.

"There's a huge need for online merchants to be able to accept online checks," she explains. "Not being able to accept checks or cash online is cutting out a significant percentage of the population." And unlike PayPal, Bolle notes, MoneyZap is backed by **First Data** ***(www.firstdata.com)***, one of the biggest payment-processing companies in the world.

The service has some drawbacks, however. Competitor PayPal has 8 million users, but MoneyZap has less than 100,000, estimates Avivah Litan, a Gartner analyst. Only about 10 Web merchants, including **Overstock.com** and **NetGrocer.com,** support MoneyZap. Bolle says the company plans to add many more merchants this year.

Another problem with MoneyZap, says Litan, is that it doesn't handle international payments, presumably to avoid cannibalizing its Western Union transfer business. "Other companies are eventually going to undercut MoneyZap in that market," Litan says.

Moreover, because MoneyZap won't let users make purchases with credit or debit cards, it's a lot less convenient to use, Litan says. Competitors such as PayPal and **Citibank's** c2it offer more payment methods. *—Elaine X. Grant*

Stinger Poised for U.S. Launch

After two years of **Microsoft** touting the marriage of the mobile phone and the PDA, consumers will soon get their hands on this phone of the future. The Smartphone 2002 platform, formerly code-named Stinger, is a customized version of Windows CE that will be licensed by Microsoft for distribution by phone manufacturers.

The first Stinger-based Smartphone, the Z100 from **Sendo** ***(www.sendo.com)***, is currently being tested in Europe and will be launched in the United States by June, according to Sendo.

The Z100 includes a 2.2-inch TFT color display and a wealth of features you would expect from a PDA—plus some unexpected ones. The Z100 will include Internet Explorer with Java, Windows Media Player for MP3s and MPEG-4 video, support for three popular e-mail protocols, a voice-memo feature, the Outlook calendar, and games. The triband phone will also support wireless synchronization of contacts and other personal information with a PC.

Sendo Z100

Accessories for the Z100 will include a video camera and MultiMediaCard/Secure Digital memory cards. In addition, the phone will eventually support Bluetooth, which would give it wireless access to the next generation of PDAs and peripherals. Some features, such as wireless video downloads, will not be viable until the third-generation wireless-access network is built, which could be a year or more away.

Sendo, better known in Asia and Europe than the United States, specializes in highly customizable mobile phones. **Samsung Electronics, Mitsubishi,** and other manufacturers are planning their own Stinger-based phones but have not yet announced release dates. *—K.S.*

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TRENDS

Thanks for The (Cheap) Memory

If you're still kicking yourself for not upgrading your system memory in late 2001 when 128MB PC133 SDRAM chips were selling for as little as $15, you can relax—slightly. Prices may never get that low again, but industry experts are confident that chips will remain relatively inexpensive over the short term.

"There's no denying that November was the best time to upgrade," says Andrew Norwood, a Gartner analyst. "Though costs may go down again in the near term, they will ultimately rise back to levels where companies are making money."

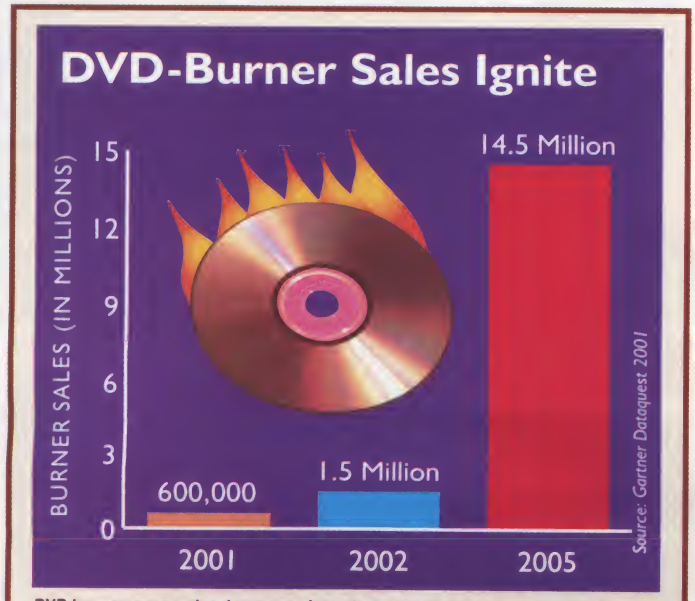
Why did these price dips and swells occur? Last year, demand for PC memory declined for the first time, and the resulting oversupply of DRAM caused prices to hit rock bottom. By year's end, signs of industry consolidation appeared when **Micron** announced it would buy **Toshiba's** U.S. DRAM factory. The company was in talks with chipmaker **Hynix,** as well.

Another factor was the arrival of **Intel's** 845 chipset, which supports DDR memory. The new chipset caused even more confusion in the industry, as suppliers weren't sure how much DDR to produce to meet demand. All of these uncertainties helped contribute to an unsteady situation where, at least for the moment, the end user is reaping the benefits.

"The memory business changes constantly," says Steve Cullen, a Cahners In-Stat analyst. "Prices probably won't be much lower than they are now, which is as good as it's going to get for a while."

In other words, buy now.

—Ellen Ullman



DVD burners are poised to move into that vacant drive bay on your PC. Gartner Dataquest estimates 1.5 million drives will ship this year. Sales would be even stronger if two incompatible formats, DVD-R and DVD+RW, were not vying for the same consumer dollars.

OVERHEARD

"One of the things you do in the technology business, if you are successful, is you take reasonable risks. If you don't, you end up with pedestrian products." —David Nagel, CEO of Palm's OS unit

Health Insurance Fully Covered by the Web

More than 1.5 million people in the United States were laid off from their jobs last year. And while the loss of employment can be disheartening, the loss of a company health plan can create even bigger problems. Individual plans can be expensive, and even if you have the funds, finding an insurance policy that fits your needs can be daunting.

eHealthInsurance *(www.ehealthinsurance.com)* aims to make the process easier, enabling consumers to find the right individual, family, or small-group coverage from among more than 10,000 policies offered by more than 100 providers. The site offers instant quotes, a FAQ, side-by-side comparisons of policies, and even online applications.

Comparison-shop online for insurance plans.

Gary Lauer, president and CEO of eHealthInsurance, says the company has been growing at a healthy rate since its launch four years ago, but has recently seen a sharp increase in sales of transitional policies, which offer coverage for six months or less.

Because health-insurance prices are largely regulated by state, they can't be discounted or negotiated, but Lauer says the company can help find the most affordable plan. And because eHealthInsurance gets a commission from the provider, there's no charge to consumers for the service.

Brad Holmes, a Forrester Research analyst, says a market exists for a service like eHealthInsurance, but it may be more valuable as a comparison-shopping tool than as a point of purchase, especially because it doesn't offer discounts. "You may compare and contrast online," says Holmes. "But whether you're going to complete a transaction is another question."

Lauer counters that the company provides more than just a shopping tool, with 100 customer-service representatives on hand to answer questions, offer advice, and even act as intermediaries with the insurance company after a policy is purchased.

—Elaine X. Grant

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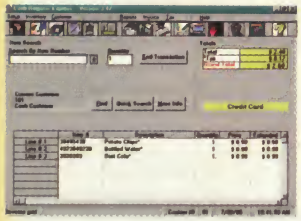

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PS3000
AMD Duron™ Processor at 1.3 GHz

- AMD Thunderbird/Duron Ready
- 200/266MHz FSB and UDMA-100 Support
- VIA KLE PC-133 and AGP Support
- 128MB PC-133 SDRAM
- 40 GB UDMA-100 Hard Drive
- 56X CD-ROM
- Trident Blade 3D Shared AGP
- Lucent PCI 56K Voice Modem and 10/100 NIC
- PCI 3D Wavetable Stereo Sound
- Atlas 440W 2.1 Speakers w/Subwoofer
- AMD Certified Power Supply

AMD Duron™ Processor

1.0 GHz	$ 459 A1401
1.1 GHz	$ 469 A1402
1.2 GHz	$ 479 A1403

$759 A2401

PS8000
Athlon XP 1700+ Processor with QuantiSpeed™ architecture

- New VIA KT266 DDR Chipset
- 200/266MHz FSB and UDMA-100 Support
- DDR PC2100 and 4X AGP Support
- 256MB PC2100 (266MHz) DDR RAM
- 80 GB UDMA-100 Hard Drive
- 56X CD-ROM
- 24X10X40 CDRW Drive
- Nvidia GEFORCE 2 MX400 DVD 3D 64MB
- Lucent PCI 56K V.90 Voice Modem
- PCI 3D Wavetable Stereo Sound
- Atlas 440W 2.1 Speakers w/Subwoofer
- AMD Certified Power Supply

AMD Athlon XP Processor with QuantiSpeed™

Athlon XP 1800+ with QuantiSpeed™ architecture	$ 769 A2402
Athlon XP 1900+ with QuantiSpeed™ architecture	$ 799 A2403
Athlon XP 2000+ with QuantiSpeed™ architecture	$ 869 A2404

$919 A3404

AS6000
Athlon XP 2000+ Processor with QuantiSpeed™ architecture

- New VIA KT266 DDR Chipset
- 200/266MHz FSB and UDMA-100 Support
- DDR PC2100 and 4X AGP Support
- 256MB PC2100 (266MHz) DDR RAM
- 60 GB UDMA-100 Hard Drive
- 16X DVD-ROM
- Nvidia GEFORCE 4 MX 420 3D DVD 64MB
- Lucent PCI 56K V.90 Voice Modem
- SoundBlaster Audigy 5.1 Sound w/SB1394 Firewire port
- Creative Labs Inspire 5.1 5300 Speakers w/Subwoofer
- AMD Certified Power Supply

AMD Athlon XP Processor with QuantiSpeed™

Athlon XP 1700+ with QuantiSpeed™ architecture	$ 809 A3401
Athlon XP 1800+ with QuantiSpeed™ architecture	$ 819 A3402
Athlon XP 1900+ with QuantiSpeed™ architecture	$ 849 A3403

$1,099 A4403

AS8000
Athlon XP 1900+ Processor with QuantiSpeed™ architecture

- New nVidia nForce Twin Bank DDR Chipset
- 200/266MHz FSB and UDMA-100 Support
- DDR PC2100 and 4X AGP Support
- 512MB PC2100 (266MHz) DDR RAM
- 60 GB UDMA-100 Hard Drive
- 16X DVD-ROM
- 24X10X40 CDRW Drive
- Nvidia GEFORCE 4 MX 460 3D DVD 64MB DDR
- nForce 10/100 Ethernet Card
- Creative Labs Modem Blaster PCI Voice Modem
- nForce APU 3D Dolby Digital 5.1 Certified Sound
- Creative Labs Inspire 5.1 5300 Speakers w/Subwoofer
- Microsoft Internet Keyboard
- Microsoft Intelli Mouse w/Wheel
- 350W AMD Certified Power Supply

AMD Athlon XP Processor with QuantiSpeed™

Athlon XP 1700+ with QuantiSpeed™ architecture	$ 1,059 A4401
Athlon XP 1800+ with QuantiSpeed™ architecture	$ 1,069 A4402
Athlon XP 2000+ with QuantiSpeed™ architecture	$ 1,169 A4404

AMD Athlon XP processor 1700+ operates at a frequency of 1.47GHz
AMD Athlon XP processor 1800+ operates at a frequency of 1.53GHz
AMD Athlon XP processor 1900+ operates at a frequency of 1.60GHz
AMD Athlon XP processor 2000+ operates at a frequency of 1.67GHz

All Atlas Micro PCs Include:
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ZD Net Editors' Choice
cnet Editors' Choice

Price.

ZD Net Editors' Choice

There should be a picture in the dictionary of the Atlas Micro under the heading "Price/Performance." This desktop system was one of the best performers we've ever seen. Yet, it costs about $1,000 less than the other high-end Athlon desktops reviewed here.

Mr. David English

CERTIFIED AMD SYSTEM INTEGRATOR

Atlas Micro uses only AMD certified components in order to achieve maximum performance and reliability. All systems built by Atlas Micro follows a very stringent guideline set forth by AMD to maintain a consistent line of high quality products. At Atlas Micro, we do not compromise quality with lower price.

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AS50	$149
.28 d.p. 1280 x 1024 @ 66Hz	
1530V LCD 15"	$399

VIEWSONIC

E70F	$219
.25 d.p. 1280 x 1024 @ 60Hz	
E95	$259
.27 d.p. 1600 x 1200 @ 60Hz	
VE150 LCD 15"	$399

ELEMENT

Cyclone 9S	$189
.25 d.p. 1600 x 1200 @ 60Hz	
Cyclone 7D	$139
.27 d.p. 1280 x 1024 @ 60Hz	
ELEMENT LCD 15"	$319

www.buy-atlas.com

All Systems are Windows XP Compliant

$599 S1403

CS6000
Intel Celeron Processor at 1.2 GHz

- Intel Coppermine/Celeron Ready Motherboard
- 133MHz FSB and UDMA 100 Support
- 128MB PC-133 SDRAM
- 40 GB UDMA-100 Hard Drive
- 56X CD-ROM
- 24X10X40 CDRW Drive
- Trident Blade 3D Shared AGP
- Lucent PCI 56K Voice Modem and 10/100 NIC
- PCI 3D Wavetable Stereo Sound
- 120W PMPO Speakers

Intel Celeron Processor

1.0 GHz	$ 569 S1401
1.1 GHz	$ 589 S1402
1.3 GHz	$ 619 S1404

$689 S2401

CS9000
Intel Pentium IV Processor at 1.7 GHz

- New Pentium IV DDR Motherboard
- 400MHz FSB and UDMA-100 Support
- DDR PC2100 and 4X AGP Support
- 128MB PC2100 (266MHz) DDR RAM
- 60 GB UDMA-100 Hard Drive
- 56X CD-ROM
- Nvidia GEFORCE 2 MX400 DVD 3D 64MB
- Lucent PCI 56K V.90 Voice Modem
- PCI 3D Wavetable Stereo Sound
- Atlas 440W 2.1 Speakers w/Subwoofer

Intel Pentium IV Processor

1.8 GHz	$ 729 S2402
1.9 GHz	$ 779 S2403
2.0 GHz	$ 919 S2404
2.2 GHz	$1,139 S2405

$989 S3403

GS8000
Intel Pentium IV Processor at 1.9 GHz

- New Pentium IV DDR Motherboard
- 400MHz FSB and UDMA-100 Support
- DDR PC2100 and 4X AGP Support
- 256MB PC2100 (266MHz) DDR RAM
- 60 GB UDMA-100 Hard Drive
- 16X DVD-ROM
- 24X10X40 CDRW Drive
- Nvidia GEFORCE 4 MX 420 3D DVD 64MB
- Lucent PCI 56K V.90 Voice Modem
- SoundBlaster PCI 128 4-Channel 3D Wavetable
- Altec Lansing AVS500 4.1 Speakers w/Subwoofer

Intel Pentium IV Processor

1.7 GHz	$ 909 S3401
1.8 GHz	$ 939 S3402
2.0 GHz	$1,129 S3404
2.2 GHz	$1,349 S3405

$1,479 S4405

GS9000
Intel Pentium IV Processor at 2.2 GHz

- New Intel i845D DDR Motherboard
- 400MHz FSB and UDMA-100 Support
- DDR PC2100 and 4X AGP Support
- 256MB PC2100 (266MHz) DDR RAM
- 80 GB UDMA-100 Hard Drive
- 16X DVD-ROM
- Nvidia GEFORCE 4 MX 460 3D DVD 64MB DDR
- Creative Labs Modem Blaster PCI Voice Modem
- SoundBlaster Audigy 5.1 Sound w/SB1394 Firewire port
- Creative Labs Inspire 5.1 5300 Speakers w/Subwoofer
- Microsoft Internet Keyboard
- Microsoft Intelli Mouse w/Wheel

Intel Pentium IV Processor

1.7 GHz	$1,039 S4401
1.8 GHz	$1,069 S4402
1.9 GHz	$1,119 S4403
2.0 GHz	$1,259 S4404

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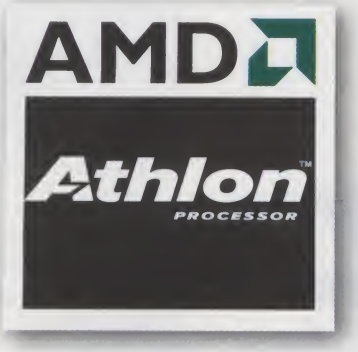

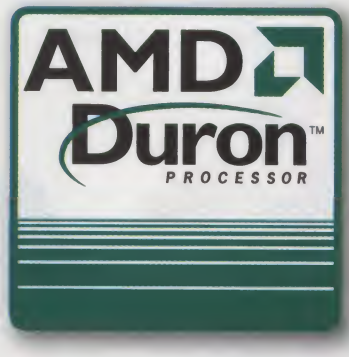

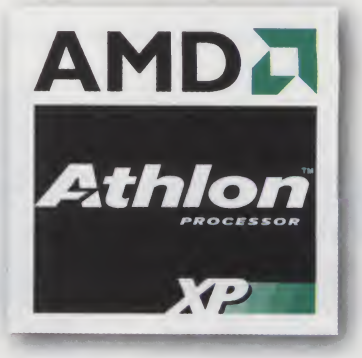

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Add Boom to Your Beige Box

EDITED BY BRIAN BENNETT

Creative Labs Sound Blaster Extigy

Outside the box:
Creative Labs, of Nomad portable MP3 player and Sound Blaster sound-card fame, has developed its first external sound processor. Dubbed the Sound Blaster Extigy, this extraordinary $149.99 audio device connects via a USB port and is designed to bring high-fidelity sound to any notebook or desktop PC.

On the desk:
Built using technology gleaned from Creative's latest Audigy PC sound card, the Extigy relies on a 24-bit/96KHz digital-to-analog converter (DAC) to gain a low 100dB signal-to-noise ratio. You can play games supporting EAX 1.0 and 2.0 positional sound, and listen to stereo MP3 or audio-CD tracks in simulated 5.1-channel sound if your speakers are equal to the task. The bundled PlayCenter 3 software lets you create and manage digital audio files, and its Audio Stream Recorder works with Internet radio stations.

In the living room:
Extigy's Dolby Digital decoder enables you to connect the device to your stand-alone DVD player, so you can watch movies in 5.1-channel digital surround sound if you have the appropriate home-theater speakers. Creative includes a wireless remote control for couch potatoes.

Pump up your volume:
Creative Labs, ***www.creative.com***

GEAR

1

2

3

1 pretty pocket pictures

Compaq iPaq handheld organizer users will delight in the new $199.99 **NexiCam** from Nexian. This nifty sleeve-like add-on module turns your iPaq PDA into a personal digital and video camera. The compact plug-in module has an 800-by-600 resolution, a 180-degree articulating lens for videoconferencing, and a 2x zoom. Using the iPaq's screen as a display, you can view your shots in either landscape or portrait mode, managing your images via the included software interface. A CompactFlash memory slot provides storage for additional pictures.

Nexian NexiCam
Nexian
www.nexian.com

2 zoom and groove

Play your CDs on the road—whether they hold traditional or MP3-format tunes—with Sony's **Xplod MEX-5DI** car stereo. Just load a CD, CD-R, or CD-RW disc into the stylish motorized tray, and you get skip-free CD playback, courtesy of G-Protection technology. Auxiliary inputs let you connect portable audio devices as well. What really makes the $1,000 MEX-5DI shine, however, is its 32,000-color TFT display. The screen displays photos you feed it though a Memory Stick slot. Plus, the unit is XM satellite-music-ready. With the Xplod onboard, you may not mind getting stuck in traffic.

Sony Xplod MEX-5DI
Sony Electronics
www.sony.com/xplod

3 untethered presentations

For nimble control during business presentations, get your hands on Logitech's $199.95 **Cordless Presenter.** Relying on state-of-the-art Bluetooth technology, the 5.1-ounce wireless device lets you deftly command compatible notebooks from 30 feet away. The Cordless Presenter has a trigger-activated laser pointer, and two buttons that let you move forward and back through your PowerPoint presentations. By adding Logitech MouseWare software, you can even use the device as a cordless mouse. The two buttons give you left-click and right-click functionality, and the center button adds scroll capabilities.

Logitech Cordless Presenter
Logitech
www.logitech.com

4 arcade dreams

Re-create your glory days of arcade gaming with the $199.95 **X-Arcade** system from XGaming. The X-Arcade is a multiplatform gaming device, so it'll work with any system, including Xbox, PlayStation and PlayStation 2, GameCube, and a PC with MAME emulation. It's decked out with dual joysticks, side pinball buttons, and one- and two-player start controls—22 buttons in all. Weighing in at a hulking 10 pounds, the X-Arcade is also built for punishment. So bring it on!

XGaming X-Arcade
XGaming
www.x-arcade.com

5 geek chic

If you want to look fashionable while protecting your various handheld devices from life's bumps and bangs, check out the $29.99 **CBT100 Handheld Organizer.** Part of the Targus Blacktop series of computer cases, this edgy and urban carryall has a quick-access cell-phone pouch, separate pockets for PDAs and accessories such as portable keyboards and digital cameras, and self-correcting nylon zippers. A padded shoulder strap boosts comfort, and the stylish rubberized Compu-Tread exterior absorbs shock.

Targus Blacktop CBT100 Handheld Organizer
Targus
www.targus.com

6 multimedia mastermind

Imagine a single handheld device that can store and access all your precious multimedia files, from digital photos and video to MP3 songs. Now stop imagining. The $329-estimated **Jukebox Multimedia** device from Archos wields a 10GB hard drive, an internal MP3 player, and a built-in LCD panel for viewing snapshots. Best of all, the USB 1.1 interface lets you snap on future modules to transform the Jukebox into a digital camera, MP3 recorder, or digital video recorder. The internal drive holds 2,500 songs, 5,000 to 30,000 photos, or 20 to 30 hours of video.

Archos Jukebox Multimedia
Archos Technology
www.archos.com

c|net Editors' Top 5

Computer Shopper and CNET.com editors handpick this month's best desktops, ultralight notebooks, MP3 CD players, and utility software. For up-to-the-minute Top Fives and full reviews, go to ***top5.cnet.com***.

MicronPC Millennia TS Professional

Leading-Edge Desktops

PRODUCT	EDITORS' RATING	PRICE	SPECS	BOTTOM LINE
Falcon Northwest Mach V* *www.falcon-nw.com*	8.2	$3,661 35168	1.59GHz Athlon XP 1800+; 512MB DDR; dual RAID 40GB hard drives; 19-inch CRT; nVidia GeForce3 Ti 500	This speedster's envy-inducing 3D scores come courtesy of its overclocked CPU and graphics chipset. Gamers and DVD-movie fans will also applaud the Klipsch ProMedia 5.1 speakers.
Gateway 700XL *www.gateway.com*	7.8	$2,999 35265	2.2GHz Pentium 4; 512MB RDRAM; 120GB hard drive; 15-inch LCD; ATI Radeon 8500G	The crème de la crème of video-editing machines, with a Northwood-based processor, front-mounted IEEE 1394 (FireWire) ports, and a DVD-RAM drive. Bundled with MGI's VideoWave 5 video-editing software.
Hypersonic Sonic Boom* *www.hypersonic-pc.com*	7.8	$2,832 35236	2GHz Pentium 4; 256MB RDRAM; dual RAID 40GB hard drives; 19-inch CRT; nVidia GeForce3	An overclocked graphics card, a 19-inch display, and flawless DVD playback combine to deliver a first-rate computing/entertainment experience. Also enables ample expansion with six bays and three PCI slots open.
MicronPC Millennia TS Professional *www.micronpc.com*	7.8	$2,199 35266	2.2GHz Pentium 4; 256MB DDR; 80GB hard drive; 19-inch CRT; nVidia GeForce3 Ti 200	The combination of Intel's latest processor and fast DDR memory helped this desktop post scores equivalent to more expensive, RDRAM-based systems. Its software bundle is also a cut above the average.
Voodoo F-Class Limited Edition PC *www.voodoo.ca*	7.9	$5,228 35285	1.6GHz Athlon XP 1900+; 512MB DDR; 100GB hard drive; 22-inch CRT; ATI Radeon 8500	This system's benchmark-burning performance is complemented by lifetime discounted upgrades, six USB 2.0-compatible ports, and a transparent window to show off its premium innards.

iBuyPower Value XP PC

Budget Desktops

PRODUCT	EDITORS' RATING	PRICE	SPECS	BOTTOM LINE
ABS Duron Special *www.abspc.com*	8.0	$699 35208	1GHz Duron; 256MB SDRAM; 30GB hard drive; 17-inch CRT; nVidia TNT2 M64	This bargain-price PC includes a DVD drive and a full-sounding three-piece speaker system. It also posted benchmark scores that bested those of similarly priced systems.
Apple iMac DV Special Edition* *www.apple.com*	8.0	$999 35286	600MHz PowerPC G3; 256MB SDRAM; 40GB hard drive; 15-inch integrated CRT; ATI Rage 128 Ultra	Not the fastest Mac on the block, but its classic, space-saving shape, CD-RW drive, and dual IEEE 1394 (FireWire) ports make it an excellent choice for home or small-office users. A recent price drop sweetens the deal.
eMachines T4155 *www.emachines.com*	7.0	$849 35287	1.5GHz Pentium 4; 256MB SDRAM; 60GB hard drive; no monitor; nVidia GeForce2 MX 200	Delivers a lot of PC for the money, with acceptable benchmark scores and both CD-RW and DVD-ROM drives. A good choice for the first-time buyer or those in the market for a supplemental PC.
Gateway 300C* *www.gateway.com*	7.7	$899 35210	1.2GHz Celeron; 128MB SDRAM; 80GB hard drive; 17-inch CRT; integrated graphics	It's not a speed demon, but this PC offers an attractive price and feature set, including a CD-RW drive. A solid pick for basic computing chores.
iBuyPower Value XP PC *www.ibuypower.com*	8.2	$799 35211	1.6GHz Pentium 4; 256MB SDRAM; 40GB hard drive; 17-inch CRT; nVidia GeForce2 MX 400	This system lives up to its name by delivering respectable benchmark scores and flawless DVD playback at a price that will have you looking twice.

* = Configuration changed from the original review.

00000 = Shopper Price It! For real-time pricing, go to *shopper.com* and enter number.

IBM ThinkPad X22

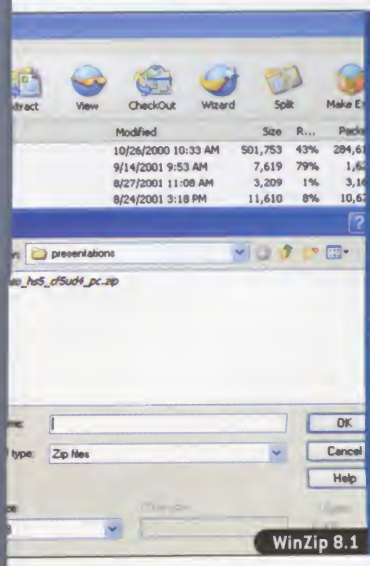
Ultralight Notebooks

PRODUCT	EDITORS' RATING	PRICE	SPECS	BOTTOM LINE
Compaq Evo N600c *www.compaq.com*	8.0	$2,578 35288	1.06GHz Pentium III-M; 128MB SDRAM; 20GB hard drive; 14.1-inch TFT; ATI Mobility Radeon; 5.5 pounds	This notebook is no lightweight in the features department. It packs in 802.11b connectivity, a DVD/CD-RW combo drive, and an amazingly sharp screen. Impressive performance and a three-year warranty seal the deal.
Fujitsu LifeBook S Series *www.fujitsupc.com*	7.7	$2,299 35289	800MHz Pentium III-M; 256MB SDRAM; 30GB hard drive; 13.3-inch TFT; ATI Rage Mobility-M1; 4.4 pounds	This latest refresh of the S Series retains the same smart chassis, fabulous battery life, and superb speed of its predecessors, while adding an internal DVD/CD-RW drive. An uncompromising notebook.
IBM ThinkPad X22 *www.ibm.com*	8.0	$2,833 35295	800MHz Pentium III-M; 256MB SDRAM; 20GB hard drive; 12.1-inch TFT; ATI Mobility Radeon; 3.5 pounds	For the business traveler, an exceptional compact notebook, packed with high-performance components. This unit serves up speed and battery life to spare.
Sony VAIO PCG-SR33K *www.sonystyle.com*	6.2	$999 35147	600MHz Celeron; 128MB SDRAM; 10GB hard drive; 10.4-inch TFT; S3 SavageIX; 3 pounds	Priced hundreds of dollars less than the competition, this VAIO offers incredible battery life and plenty of power for most office applications. An IEEE 1394 (FireWire) port and a generous software bundle round out the package.
Toshiba Portégé 4000 *www.toshiba.com*	7.4	$2,429 35173	750MHz Pentium III-M; 256MB SDRAM; 30GB hard drive; 12.1-inch TFT; Trident CyberBlade XP; 4.4 pounds	A 4.4-pound travel weight, Bluetooth and 802.11b wireless support, and a three-year warranty make the 4000 a great choice for business professionals who can overlook its cramped keyboard.

Sonicblue RioVolt SP250

MP3 CD Players

PRODUCT	EDITORS' RATING	PRICE	SPECS	BOTTOM LINE
Imation RipGo *www.imation.com*	7.7	$349 35258	Supports CD, MP3, WMA, WAV, mini-CD-R (185MB); 8 minutes skip protection; USB interface; 8 ounces	A portable MP3 mini-CD player that doubles as a mini-CD burner. The RipGo is short on battery life but offers good sound quality and plenty of programmability.
IRiver iMP-350 SlimX *www.iriver.com/english*	8.5	$199 35290	Supports ASF, CD, MP3, WMA; 8 minutes skip protection; 6.7 ounces	Don't be fooled by its slim exterior—this player is packed with extras, including an inline remote, decent antiskip protection, and excellent battery life assisted by an external battery pack.
Sonicblue RioVolt SP100 *www.riohome.com*	7.7	$169 35291	Supports CD, MP3, WMA; 2 minutes skip protection; 8.2 ounces	Although it's not as refined as the SP250, the SP100 still has plenty of perks to offer, including superior navigation features, the ability to read ID3 tags, and upgradable firmware.
Sonicblue RioVolt SP250 *www.riohome.com*	9.0	$179.95 35292	Supports CD, MP3, WMA; 8 minutes skip protection; 8.2 ounces	This RioVolt comes packed with features, including an FM tuner, a high-contrast LCD, and an assortment of convenience features, including a wired remote and a leather carrying case.
TDK Mojo CD-MP3 Digital Jukebox *www.tdk.com*	7.2	$149.99 35293	Supports CD, MP3; 8 minutes skip protection; 12 ounces	Lacks some amenities, such as a remote control, but tops its competition with jukebox-style navigation and the best antiskip protection we've seen in an MP3 CD player.



WinZip 8.1

Utilities

PRODUCT	EDITORS' RATING	PRICE	REQUIRES	BOTTOM LINE
GoBack 3 Deluxe *www.goback.com*	9.0	$49.95 (boxed), $39.95 (download) 34908	Pentium or faster; 64MB RAM; 10MB hard drive space	Enables intuitive and reliable system restoration. Works in the background without noticeable performance degradation. A good alternative to Windows Me and XP system-restoration utilities.
GoToMyPC *www.gotomypc.com*	8.6	$119.40 (annually)	Always-on broadband Net access (on host PC)	The best way to access files, retrieve e-mail, and run programs on a remote computer. But look elsewhere if you need the highest level of security, or don't have an always-on *Net connection.*
Norton CleanSweep 2002 *www.norton.com*	8.6	$29.95 35294	100MHz Pentium or faster; 32MB RAM; 18MB hard drive space	Users looking to reclaim hard drive space will find this robust disk-cleaning utility offers an unbeatable combination of value, design, and function. Deletes unwanted programs and files, and zaps Internet clutter.
PartitionMagic 7.0 *www.powerquest.com*	7.8	$69.95 35096	Requirements vary depending on OS	This program's awesome partitioning power lets you run multiple operating systems on a single machine. It's simple to use and provides additional utilities to help you avoid potential conflicts.
WinZip 8.1 *www.winzip.com*	8.0	$29 34850	Pentium or equivalent	The fastest *zip utility* currently available, WinZip 8.1 integrates well with Windows XP and allows you to password-protect archives, as well as split them into smaller bits.

When work weighs you down,
I won't.

The NEW ultra-thin, ultra-light Dell Latitude C400 business notebook. Starting at a mere 3.6 lbs,[9] I'm also ultra-mobile. Sleek and stylish – I'm only an inch thin – I'm as easy on the eyes as I am on the shoulders. I'm wireless ready, thanks to my standard dual wireless antennas and an optional wireless LAN connection. Factor in the extraordinary power of my Mobile Intel® Pentium® III-M Processor at up to 1.20GHz and my SpeedStep technology that helps conserve battery power, and I'm one souped-up little machine. And since you get a direct relationship with Dell, you can customize all of this technology according to your needs. I'm living proof that big things do come in small packages.

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***PC Magazine* Editors' Choice**
Latitude C400 Notebook
– November 2001

Dell | Small Business

Latitude™ C510 Notebook

NEW Wireless-Ready Value Notebook
- Intel® Celeron® Processor at 1.06GHz
- 14.1" SVGA Active Matrix Display
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- Windows® XP Home
- Modular 24x Max CD-ROM/Floppy Drive
- Internal 56K Capable[6] Modem and 10/100 NIC
- Internal Wireless-Ready Antenna
- 1-Yr Next Business Day On-Site Service[3]

$1199 QuickLoan: **$32**/mo., 48 mos.[11] **E-VALUE Code: 10801-790311**

Recommended upgrades:
- TrueMobile™ 1150 Integrated Wireless Solution,[4] add $99
- 3-Yr Next Business Day On-Site Service,[3] add $298

Latitude™ C400 Notebook

NEW Ultra-Light Notebook, Only 1" Thin and 3.6 lbs!
- Mobile Intel® Pentium® III Processor at 866MHz-M
- 12.1" XGA Active Matrix Display
- 128MB PC133 SDRAM; 10GB[5] Ultra ATA/100 Hard Drive
- Intel® 830M Integrated Graphics up to 32MB SDRAM (shared[10])
- Windows® XP Professional
- External Floppy Disk Drive
- Internal 56K Capable[6] Modem and 10/100 NIC
- Internal Wireless-Ready Antenna
- 3-Yr Next Business Day On-Site Service[3]

$1799 QuickLoan: **$48**/mo., 48 mos.[11] **E-VALUE Code: 10801-790317**

Recommended upgrades:
- TrueMobile™ 1150 Integrated Wireless Solution,[4] add $99
- 3-Yr CompleteCare™ Service,[20] add $169

Latitude™ C610 Notebook

NEW Mainstream Thin & Light Notebook
- NEW Mobile Intel® Pentium® III Processor at 1.0GHz-M
- 14.1" XGA Active Matrix Display
- 128MB PC133 SDRAM
- 20GB[5] Ultra ATA/100 Hard Drive
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RIK FAIRLIE

Protect Your Right To Copy, Write CDs

Don't let the record labels run roughshod over your right to digitally duplicate the music you own.

CHARLEY PRIDE OUGHT TO BE ASHAMED. THE VETERAN country-music singer was the first recording artist to unleash a copy-protected CD in the United States. The disc, *A Tribute to Jim Reeves*, employs technology that renders audio CDs unreadable by many computers and disc players, and blocks the ability to "rip" the music to PC hard drives. Its mission is to ensure pirated versions of copyrighted songs aren't freely distributed on the Web.

Although Pride's label is a little-known outfit in Nashville, industry giants such as Universal Music Group have already begun a campaign to stealth-market copy-proof CDs. Universal has issued a copy-protected album, *More Fast and Furious*, and company execs have said they plan to copy-protect a significant number of additional releases this year. Other big labels, including BMG, EMI, Sony, and Warner, also plan to sell compromised CDs, but have turned down the volume on specific information.

It all adds up to a flawed attempt to protect copyrights and quash music piracy, says U.S. Rep. Rick Boucher (D-Va.), a champion of consumers' fair-use rights. "I think the record labels are making an enormous mistake," he says.

Boucher is on the money, and here's why you should up the ante. The purchase price of an audio CD, which is advancing on $19, entitles you to spin up a disc in any device you choose, be it a home or car CD player, a DVD unit, a PC optical drive, a portable digital-audio device, or even an Xbox. You're also free to duplicate the music for personal use, whether you're burning a disc for your Honda's CD player or ripping an MP3 file for your iPod. (Sorry, you can't legally copy a disc and give it to a friend or share tunes over file-swapping clients such as BearShare.)

Record companies haven't even agreed to label copy-proof discs, which means you won't know whether you've got garbage until you buy it. Even if companies did label discs, the technology is a clear-cut violation of personal-use laws. "We have traditional fair-use rights that are embedded in the First Amendment and enable individuals to use a small amount of copyrighted material without consent from the copyright owner," Boucher says. "With CDs, you should be able to make a compilation CD in precisely the order you want or create a playlist on your computer, as long as it's for personal use."

> Consumers concerned about copy-protected CDs should write their congressional representatives, politely complain at the retail store, and demand a refund on any dysfunctional discs.

Boucher says if the technology prevents consumers from playing a disc on a PC, it certainly infringes on fair-use rights. He's awaiting response to a letter he sent the Recording Industry Association of America in January seeking clarification on whether the technology behind copy-proofing CDs violates the federal Audio Home Recording Act of 1992. The representative hasn't proposed any legislation—yet. "If I don't get a response, I will consider the next step," he says.

Congressional action is a sensible course, agrees Fred von Lohmann, senior intellectual-property attorney for the Electronic Frontier Foundation, a watchdog group that has been active in copyrights battles. "Given the fact that we've had 20 years of expectations with the CD, I think we should consider passing legislation," he says. "When I lay down $18 for a CD, I expect to be able to copy it."

For now, record companies should agree to slap a warning label on copy-proof discs so shoppers can decide whether they're willing to invest in a compromised CD. And, for good measure, they should segregate them in a separate section of the store, much like DVDs occupy their own area.

Another option may be to sell these dysfunctional discs at a discount. Slim chance, according to von Lohmann. "We're a long way away from them offering choices like that—they're not even willing to label," he says.

Consumers concerned about copy-protected CDs should tap out letters to their congressional representatives. (Head to ***www.congress.org*** if you're unsure of whom to write.) It's also a good idea to politely complain at the retail store; sure, you may be a nuisance, but your dissatisfaction just might boomerang to the record label. Finally, you have the right to return any copy-protected CD and demand a refund.

This clash over the right to copy music is just the overture. Von Lohmann warns that copyright owners are considering ways to block duplication of all kinds of content on a wide range of technologies, including HDTV, wireless networks, and hard drives. "We [the EFF] are in dozens of standards bodies trying to fight this," he says.

You should join the battle. If you pay full price, you're entitled to full—and fair—use. It's your data, after all.

Rik Fairlie is editor of Computer Shopper. *Contact him at* **rik.fairlie@cnet.com.**

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STEVE FOX

PC Meets TV: This Time We Mean It

It's been nearly a decade since we first started telling you about convergence. Now it's finally headed for your living room.

NOW THAT WE'VE STOPPED TALKING ABOUT IT, IT'S FINALLY happened. The "we" I refer to are the press and other smarty-pants tech analysts (myself included). The "it" is convergence—the merging of PC, TV, audio, and Internet connectivity. Think of it as living room meets office.

Convergence was supposed to happen in the mid-'90s. How many of you remember the Gateway Destination? A poster child for dashed convergence dreams, this PC/TV combo boasted a 31-inch screen, a wireless keyboard, hot graphics, and a $4,000 price. The Destination was targeted squarely at the family room. But consumers simply weren't biting. In truth, the technology wasn't ready. Today it is.

If you're looking for evidence, I direct you to exhibit A, the Consumer Electronics Show (CES), which took Vegas by storm back in January. With slick product introductions and scads of exhibitors and attendees, this was simply the best CES I've ever attended. In fact, CES has become the most influential technology show in the United States, surpassing the lackluster COMDEX and the attendance-challenged PC Expo. As always, old-guard consumer-electronics standbys—high-end speakers, car audio, still cameras, home theater systems—commanded a fair share of exhibit space. But this year, PC makers and software vendors took up more real estate than ever. While every other major tech show is in the doldrums, *CES, a potent* brew of consumer electronics and computers, is electric.

> While every other major tech show is in the doldrums, CES, a potent brew of consumer electronics and computers, is electric.

The show's vitality offers a sign that convergence has arrived. The search logs at CNET—online research is the hook from which I hang this column, so bear with me—offer another. The week before CES started, all attention was on the Macworld trade show. Steve Jobs was preparing a blistering keynote, and *Time* magazine was striking a secret deal to put the wacky new desk-lamp-lookalike iMac on its cover. In my "Buzz Meter" column ***(buzz.cnet.com)*** later that week, I noted Macworld had made the "Buzz" cut by showing a huge weekly percentage increase in searches. CES, due to open one day later, had not. The following week, with the battling trade shows in full swing, both CES and Macworld made the "Buzz" list, indicating interest was still growing.

Then a peculiar thing happened. In week three, after both shows had shut their doors, CES made the "Buzz Meter" again. More people had searched for information on CES *after* it had shut down than when it was in session. Generally, once a trade show closes, interest disappears faster than an Enron document before a congressional hearing. Macworld, COMDEX, and PC Expo followed that pattern. Yet there was CES, still grabbing headlines.

Mind you, readers don't necessarily care about trade shows—just about the products, trends, and services that come out of them. This was an especially good year for CES product introductions, particularly those that promised to give your living room a digital makeover. Even weeks before CES had started, rumors were circulating about a groundbreaking product from Rearden Steel, a stealth startup founded by WebTV creator Steve Perlman.

Perlman didn't disappoint, rolling out Moxi, the company, and the Moxi Media Center, a home entertainment system that turns a digital set-top box into a music jukebox, personal digital video recorder, and Web-browsing station. Moxi was the talk of CES; it was also a "Buzz Meter" powerhouse. So was Microsoft's Mira, software for a portable, wireless flat-panel display you hook up to your PC to connect all the digital devices in your home. Other CES innovations generated heat, even though they missed the 10-item cutoff for the "Buzz Meter."

As in a good horse race, no one knows which products will win. Some vendors are betting on products that incorporate entertainment technologies into the computer, while others are betting on those that add computer functionality into the entertainment center. The first category includes such CES barn burners as Creative Labs' Sound Blaster Extigy, an external sound card that connects to your PC's USB port to deliver high-quality audio for digital music and DVDs. Other products that place the computer at the red-hot center of the digital entertainment universe are Sony's VAIO Digital Studio, a PC-entertainment hybrid that features TV, music, recording, and playback; and nVidia's Personal Cinema, which promises to turn your PC into a personal digital VCR. However, the product that sits squarely in the entertainment camp, the Moxi set-top box, is the one that garnered more media coverage than anything else on the show floor.

Ultimately, consumers' checkbooks will declare the winners. Odds are good, though, that someday soon, you'll have one of these devices in your living room. And all those smarty-pants media types will have something to rhapsodize about again.

Steve Fox tracks traffic patterns, search terms, and clickthroughs on CNET.com, the flagship site of *Computer Shopper's* parent company, CNET Networks, to provide insight on where technology is heading.

Steve Fox **(steve.fox@cnet.com)** *is editorial director of CNET.com. For more tech trends, read his weekly "Buzz Meter" column at* **buzz.cnet.com.**

SECTION CONTINUES ON PAGE 50

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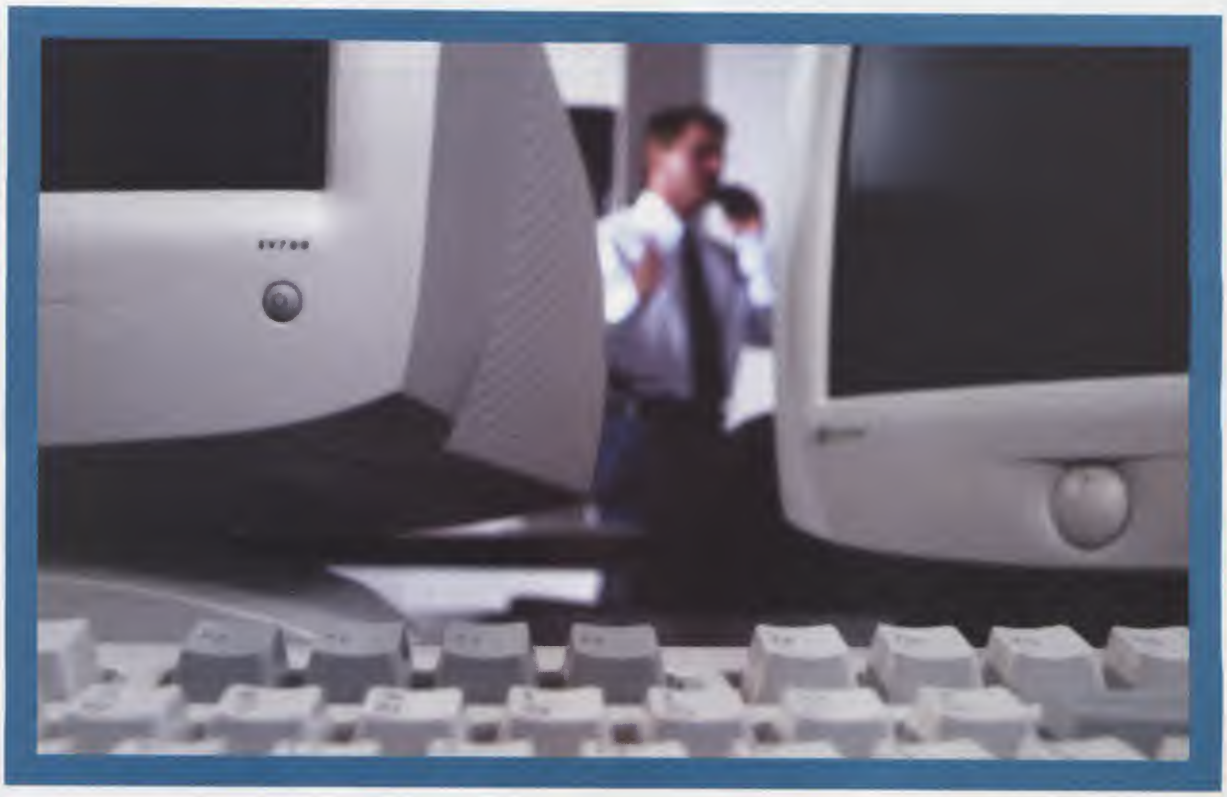

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JOHN C. DVORAK

The Bounce-Back Phenomenon

Some truly amazing technologies tank because they're ahead of their time, only to reemerge later as success stories.

A CURIOUS THING ABOUT THE TECHNOLOGY GAME IS something I call the "bounce-back phenomenon." We've seen it so many times, you'd think it would be easy to predict. But if it were, we'd all be rich.

An example of this phenomenon is pen-based computing. Suddenly, pen-based computing was in the news. It was the next big thing. Machines such as the Apple Newton and the Momenta were going to take the world by storm. It even freaked out Microsoft, which promptly promoted vaporware products called the WinPad and PenWindows.

I always thought the idea was ludicrous and ragged on its promoters relentlessly, knowing it was going to be a bounce-back technology. Like other bounce-back technologies, pen-based computing was far ahead of its time, and the visionaries who promoted it used dubious, if not completely bogus, assertions to convince themselves it would be an immediate hit.

Few things in technology are immediate hits unless they're behind the tech curve. Take the compound bow. This bow-and-arrow lash-up appeared in a 1966 patent and later, in the 1970s, as the incredible Jennings Arrowstar. Invented by a Missourian named Howless W. Allen, it uses wheels and pulleys to increase the bow's energy and make it easier to pull and control.

Despite a few roadblocks by some archery purists, the compound bow became the standard without going through any bounce-back phenomenon. It should have been invented a thousand years earlier when bows were necessary weapons of war. Generally speaking, only products that should have been invented earlier don't go through bounce-back. This is why we witnessed an Internet and e-commerce bubble, and why the market for pen-based computing finally bounced back in the form of the Palm and Pocket PC platforms.

> The market for pen-based computing finally bounced back in the form of the Palm and Pocket PC platforms.

The key is to identify bounce-back candidates and position yourself to take advantage of them. But first you have to separate the true bounce-back candidate from the bad idea. Then you have to set a timeline for the bounce-back phenomenon, which can vary. Based on the time frame for the emergence of Palm, the return of the PC clone in the 1980s, and the notebook-computer vogue, the typical bounce-back period is two to five years. You'll recall the pure notebook (ultralight and lacking a floppy drive) began as a rocky proposition. It then emerged as a bounce-back winner four years after the first one appeared and flopped. The exact times are arguable, but the point is, timing helps.

Timing becomes easy to spot as technologies move forward and change; identifying the candidates is harder. The gold mine of candidates comes from the fallout of the dot-com bust. Wacky ideas such as pet food delivered by Federal Express to what-for concepts such as Flooz or Beenz litter the seabed with wreckage.

It helps to reverse-engineer earlier collapses to see where bounce-back may apply. The evolution from pen-based computer to successful handheld device is the easiest to understand. What can we learn from this transition, and can we generalize from what we learned?

Early enthusiasm, projected market share, and research reports about growth rates tell us nothing; we learn more from mistaken assumptions. In a bounce-back technology, the first iteration—the genuine invention phase—is riddled with mistaken assumptions because nobody knows anything about the product or the market for it. This is the nature of innovation. Something cool is invented, and awestruck observers create all sorts of grandiose fantasies around it. But being awestruck is not being in a state of objectivity.

Buried among the fantasies are absolutes that come to pass during the bounce-back phenomenon. In the case of the handheld computer, which is evolving into a full-blown computer, about half the assumptions concerning its usefulness are now being realized. The form factor has changed dramatically, but the original may be returning in the form of a Web pad.

A commonality among early introductions of bounce-back inventions is a rationale that makes no sense in a world of change. The pen-based computer was supposed to appeal to executives who couldn't type—the ones with secretaries who took dictation. The thinking was this executive would dump the secretary to use this contraption. Compounding this error in judgment was the belief that the keyboard was some sort of short-term device that would be replaced by natural handwriting. This was the biggest error in analysis. Keyboards are modern, and more and more people use them in lieu of handwriting. Anyone with kids knows they can barely write legibly, but they can type like banshees.

Looking for these and other false assumptions helps you get past phony rationales to see if anything real exists under the surface. Many of the good ideas and technologies that have tanked over the past couple of years will be legendary bounce-back candidates. It will take skill to spot them early. All I can be sure of is it won't be pet food delivered by FedEx.

John C. Dvorak hosts TechTV's Silicon Spin *and is currently working on two books. Reach him at* **shopper@dvorak.org.**

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Pentium 4 Performance At a Popular Price

DELL'S DIMENSION 4400 MAY LOOK LIKE JUST ANOTHER STOLID BLACK-and-gray tower for mainstream computing, but it has one key difference: Intel's 845D chipset, which lets PC makers use cheaper DDR SDRAM in Pentium 4 systems. This advance means you can enjoy a well-designed, reasonably equipped, and relatively speedy system with plenty of RAM for less money.

We've been waiting for the 845D. It promises real Pentium 4-level performance without the RDRAM-level prices. And at $1,529, the Dimension 4400 is economical as well as speedy. Configured with a 1.8GHz CPU and 256MB of DDR SDRAM, it turns in application-performance benchmark scores slightly higher than a 1.7GHz Dimension 8200 equipped with 256MB of RDRAM. Even more interesting, it outpaces a Dimension 4300 using a 1.7GHz CPU and 128MB of plain old SDRAM by 10 percent to 20 percent. And although it's not designed to be a gaming system, the Dimension 4400 packs a 64MB GeForce3 Ti 200-based graphics card, which delivers 144 frames per second (fps) on Quake III Arena. That's more than fast enough to satisfy even hard-core types.

The rest of the Dimension 4400's components are solidly midrange and what you'd expect in a system at this price. You get ample storage with a 7,200rpm 40GB hard drive, a 16x DVD-ROM, and a 24x/10x/40x CD-RW drive. The audio subsystem consists of a Sound Blaster Live Value card and a three-piece Harman Kardon HK395 speaker set. Everything works well together for encoding and listening to music, burning CDs, and watching DVDs.

The system design makes it easy to add components. The system has all the requisite ports except IEEE 1394; two of the four USB ports, as well as a headphone jack, are located in the front under a flip-top cover. You get two open 3.5-inch bays (one externally accessible), two free PCI slots, and one free DIMM socket. To open the tool-free clamshell design, you lay the case on its side, press two latches at the top and bottom, and unfold it like a book. All the drive rails are neatly hooked to the inside of the chassis, and all drives and cards come out with some pressure and pulling. The only users who won't like this convenient design are those who prefer to leave their systems open for frequent upgrades; unfolded, the Dimension chassis takes up a lot of room.

The flat-face Dell M782 17-inch CRT bundled with our system produced a bright, crisp image and a broad array of onscreen menu controls, but unless you're strapped for space or money, we'd recommend upgrading to a 19-inch screen for a bigger view.

The software and accessories that come with the Dimension 4400 fit the needs of mainstream users. The standard Dell keyboard has a mushy feel that we don't like much, but you do get the convenience of three quick-launch buttons for files or applications—and an easy-to-use utility for programming them. The software bundle includes a variety of Microsoft consumer applications, including Works Suite with Word and the basic spreadsheet application; the Money personal-finance program; Streets & Trips for travel navigation; and for photo editing, Picture It Photo and Dell Picture Studio. Those who yearn to burn (discs, that is) will appreciate the bundled copies of Easy CD Creator 5 and CyberLink PowerDVD.

Dell's Solution Center provides extensive, well-organized electronic documentation supplemented by a thorough paper manual. The excellent online support uses innovative tools, such as the ability to scan your system and determine your configuration so that you get customized information. All the documentation and drivers are also available online. Though the cost of the system we evaluated includes a one-year warranty for parts, labor, and phone and onsite service, you can boost coverage to as much as four years, including lifetime phone support, for $219. Tech support is toll-free and available around the clock for the length of the warranty.

With better performance than an SDRAM-based system and a lower price than a similarly configured RDRAM-based PC, the Dell Dimension 4400 and its 845D chipset help define a new archetype for midrange systems. If you're looking for a solid general-purpose system that's priced right, this one achieves such a balance with few compromises.

—Lori Grunin

EDITORS' RATING 7.4
RATED 1 TO 10

< PROS >
Healthy consumer-oriented hardware, software bundle; excellent support options/tools

< CONS >
Small display; no IEEE 1394 port; mushy keyboard

DIRECT PRICE: $1,529

< SPECS >
1.8GHz Pentium 4; 256MB DDR; 40GB hard drive; 16x DVD; 24x/10x/40x CD-RW; 17-inch Dell CRT; nVidia GeForce3 Ti 200 graphics (64MB); Sound Blaster Live Value; Harman Kardon HK395 speakers; Ethernet card; Windows XP Home Edition; Microsoft Works Suite 2002; additional software

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AMD Athlon™ XP Processor 1900+ with QuantiSpeed™ architecture** outperforms competitive 1.90GHz processors — **$1839** #A419

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Component-Rich System Missing Competitors' Muscle

CYBERPOWER'S $1,995 GAMER PLATINUM PRO DESKTOP BRISTLES WITH enough high-tech components to make any gamer or video editor sigh. Unfortunately, all this equipment must have weighed it down; the system's Athlon XP 1900+ processor (which runs at 1.6GHz) couldn't keep up with its peers in our performance tests. Even so, for the price, you're still getting a plenty-fast, well-equipped machine.

Don't worry too much about the Platinum Pro's shortfall in our BAPCo SYSmark 2001 tests. It's still a very fast system; it just isn't as over-the-top fast as other Athlon XP 1900+ systems we've seen. It trailed a similarly equipped Polywell Poly 880XP-1900 that recently passed through our labs by some 8.5 percent overall. What's more, it lagged behind every Athlon XP 1900+ system we've benchmarked on all fronts, performing more like an 1800+.

How could a system this souped-up be so comparatively slow? Memory testing with SiSoftware's Sandra reveals the Cyberpower PC's 1GB memory bandwidth lags behind the 512MB-equipped Polywell system by about 16 percent, which could account for the discrepancy.

Maximum performance is about the only thing the Platinum Pro doesn't have in excess. Although the motherboard is already stuffed with 1GB of DDR SDRAM, there's room for another 1GB. An 80GB hard drive, an ATI All-in-Wonder Radeon 8500 DV graphics card, a Creative Labs Sound Blaster Audigy Platinum eX sound card, and a 140-watt Altec Lansing 4100 4.1 speaker system make this a media system to love. DVDs looked good on the 17-inch CTX PV720 LCD, which has a native resolution of 1,280 by 1,024. And there's just something about having two 1-inch drivers in each of the four satellites and a pair of 5.25-inch long-throw woofers that make movie soundtracks (not to mention game audio) thunder.

Tired of games and DVDs? Watch television. The graphics card has a tuner—all you need is the antenna. Getting video from your camera into the Platinum Pro is easy, thanks to multiple IEEE 1394 (FireWire) and USB ports; two of the latter are front-mounted. Also up front, the Audigy card's drive module makes connecting audio equipment a lot easier. All we'd wish for would be a DVD burner, which Cyberpower doesn't offer yet. We also noted a couple of curious, more basic omissions, including modem and Ethernet cards. (Cyberpower notes that a modem will be included in shipping configurations for the same price.)

In some ways, this system is too much of a good thing. Take the raft of remotes. Aside from the Audigy Platinum drive box, you'll need space for the speakers' wired remote, and the Audigy and Radeon cards have their own wireless remotes. If using a mouse has become *that* passé, a single, universal control is still a better idea than juggling several at once.

Then there's the slick-looking Cooler Master midtower case. It could be an expansionist's dream, with one 3.5-inch and two 5.25-inch front-accessible drive bays, three more 3.5-inch internal bays, and enough fans to keep the innards well-ventilated. But you'll feel like you need a machete to get through the jungle of cables and wires inside; they're neatly tied, but there are just so many of them. Also beware the lightweight aluminum side panels: They're thin enough to slice your fingertips. Opening the case is a big hassle, requiring both a Philips screwdriver and a hex wrench to remove more than a dozen screws. These days, tool-free access has become nearly standard, and the lack of it here was surprising.

Cyberpower's support policy is lengthier than most: a three-year parts-and-labor warranty with one year of onsite service. Toll-free phone support is available around the clock. For a small company, it's made some big service commitments.

The Cyberpower Gamer Platinum Pro is a good overall value, packed with plenty of attractive parts. Though its performance shortfall is large enough for us to measure, most users won't notice it. Many gamers and video editors will be willing to take a slight performance hit in exchange for everything this capable desktop offers.

—*Bill O'Brien*

EDITORS' RATING 7.5
RATED 1 TO 10

< PROS >
Stylish case; 17-inch LCD; TV tuner; desirable speakers

< CONS >
Thin aluminum side panels can cut fingers; masses of interior cabling impede access; too many remotes; no network card; no modem

DIRECT PRICE: $1,995

< SPECS >
1.6GHz Athlon XP 1900+; 1GB DDR; 80GB hard drive; 20x/10x/40x CD-RW; 16x DVD; 17-inch CTX LCD; ATI All-in-Wonder Radeon 8500 DV graphics (64MB); Creative Labs Sound Blaster Audigy Platinum eX; Altec Lansing 4100 speakers; Windows XP Professional; Corel WordPerfect Suite 2002

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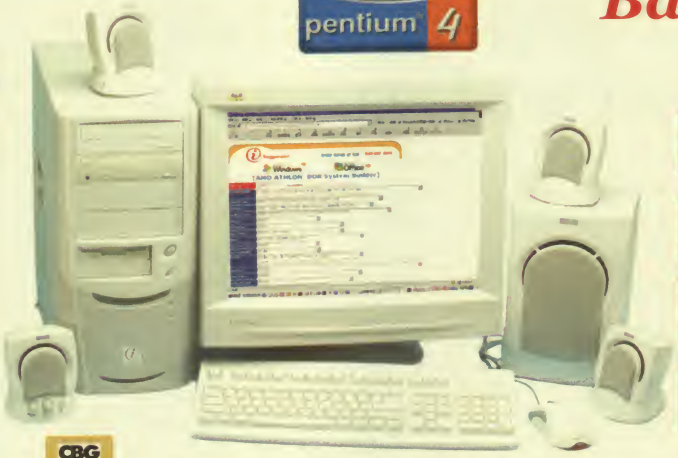

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EMACHINES T4155

Budget PC Is Long on Features, But Falls Short on Support

AIMED AT FIRST-TIME BUYERS OR THOSE SEEKING A SECOND PC, THE T4155 is another inexpensive *volkskomputer* from eMachines. But although the T4155 is plenty fast and has a decent set of features, the company's tech support is still uneven despite apparent improvements.

The eMachines T4155 shoehorns a lot of features into a diminutive case—almost to a fault. The minitower desktop starts with a 1.5GHz Pentium 4 and 256MB of 133MHz SDRAM. The 60GB hard drive is slightly less impressive with its 5,400rpm spin rate. A 12x DVD-ROM and a 12x/8x/32x CD-RW drive occupy the two drive bays. Video is served up by a 32MB card based on the nVidia GeForce2 MX 200 chipset. The system offers four USB ports (two on the front), as well as two serial ports, a game/MIDI port, and an ECP parallel port. All this costs just $1,099 (before a $50 rebate), including the monitor.

It's a good thing the T4155 comes with so much, because there's not much room to add more. The compact FIC motherboard has three PCI slots, one holding a generic 56kbps modem. Card and memory expandability is adequate; both audio and Ethernet are integrated onto the motherboard, leaving the system's remaining two PCI slots available. One of the motherboard's two DIMM slots remains open, permitting a total of 1GB of 133MHz SDRAM. But if you want to add an internal Zip drive or another such component, you're out of luck; no additional drive bays are available.

The T4155 performed better than many other low-cost desktops we've tested. We compared it with the iBuyPower Value XP PC, which led the pack in last month's roundup of bargain desktops. The T4155 has a slightly slower CPU, but it managed to stay close behind the iBuyPower system in our SYSmark 2001 tests, and it actually posted a slightly faster frame rate in Quake III Arena. However, neither system will satisfy a serious gamer's need for speed; for that, you'll need a higher-end graphics card.

Although eMachines poured plenty inside the T4155, the company seems to have skimped on the external components. The 17-inch MF17c monitor that came with our evaluation system is a basic unit with decent onscreen controls. Like most low-cost units, it has its shortcomings (in this case, minor pincushion distortion and a slightly rotated screen image). Most mainstream users will either not notice or not mind these problems, but graphics professionals won't be satisfied. The T4155's generic keyboard and Logitech two-button mouse are only adequate. Little can be said for the small speakers that come with the system. They're plenty loud, thanks to a built-in amplifier, but volume isn't everything. They're tolerable for voice and Windows sound effects, but music sounds awful.

When it comes to extras such as software and documentation, the T4155 turns in a mixed performance. Setup was easy, thanks to color-coded plugs and a decent setup poster. The OS is Windows XP Home Edition; other bundled applications include Microsoft Works 6.0, Microsoft Money 2002, CyberLink PowerDVD, and a trial subscription to Encarta Online. This mix gives you plenty right out of the box.

eMachines' service and support remain dicey, however. The company recently upgraded some of its policies—a good thing, though a recent CNET review still found several holes. (CNET Networks is *Computer Shopper's* parent company.) Its Web site offers a decent variety of FAQs, tips, and driver downloads, as well as chat and e-mail support. Free phone support was extended from a miserly 15 days to a more typical one year, the same length as the parts and labor warranty. Hardware repairs could be easier with new programs that include nationwide authorized service centers. Most distressing, when we recently tried to call tech support, we found it nearly impossible to get through. Novices who need a lot of handholding should approach this system with caution.

The eMachines T4155 delivers a decent amount of computer for the money, but it comes with a hidden cost: uneven follow-through on the company's support policies. Bargain hunters who can shoulder the support burden may not mind this risk, but novices may want to steer clear.

—*Matthew Klare*

EDITORS' RATING 7.4
RATED 1 TO 10

< PROS >
Low price; fast for a bargain PC; includes both DVD-ROM, CD-RW drives

< CONS >
Limited expandability; tech support hard to reach; small, inferior-sounding speakers

DIRECT PRICE: $1,099

< SPECS >
1.5GHz Pentium 4; 256MB SDRAM; 60GB hard drive; 12x DVD; 12x/8x/32x CD-RW; 17-inch eMachines CRT; nVidia GeForce2 MX 200-based graphics card with 32MB RAM; integrated sound; integrated Ethernet; Windows XP Home Edition; Microsoft Works 6.0; additional software

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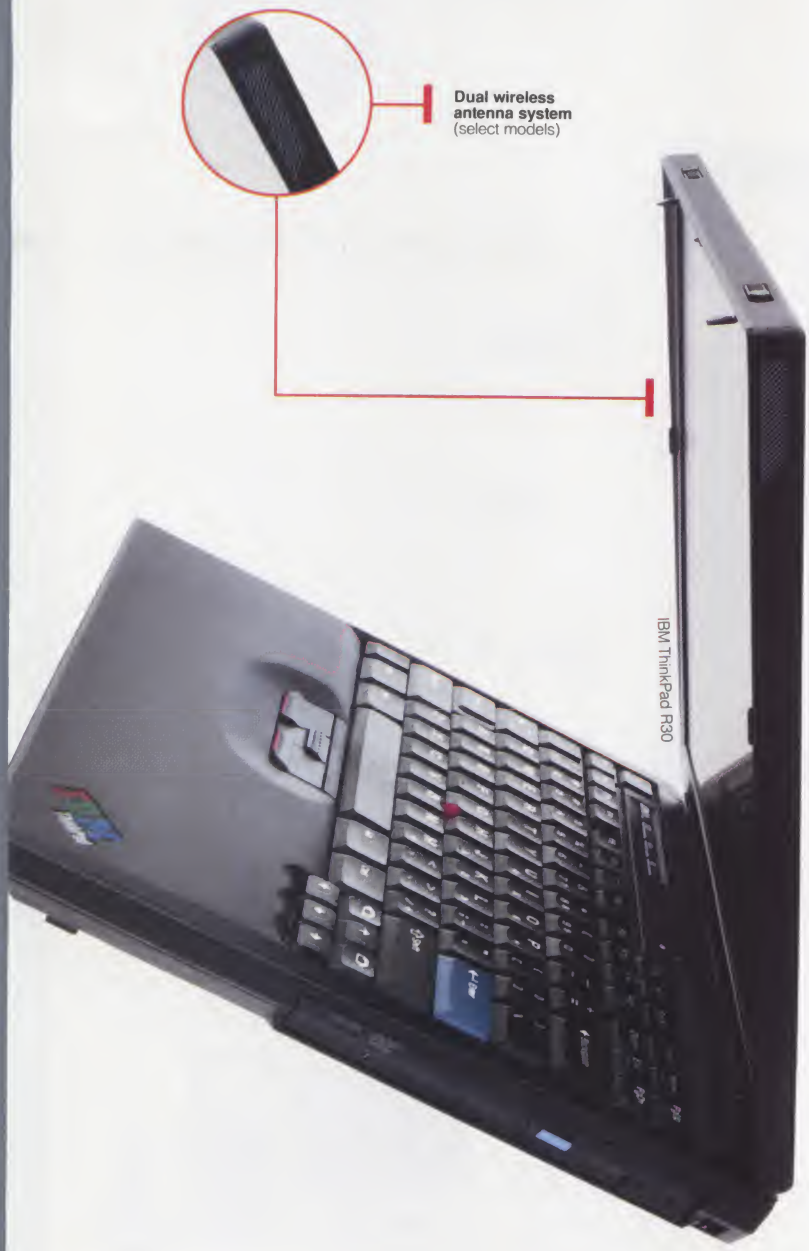

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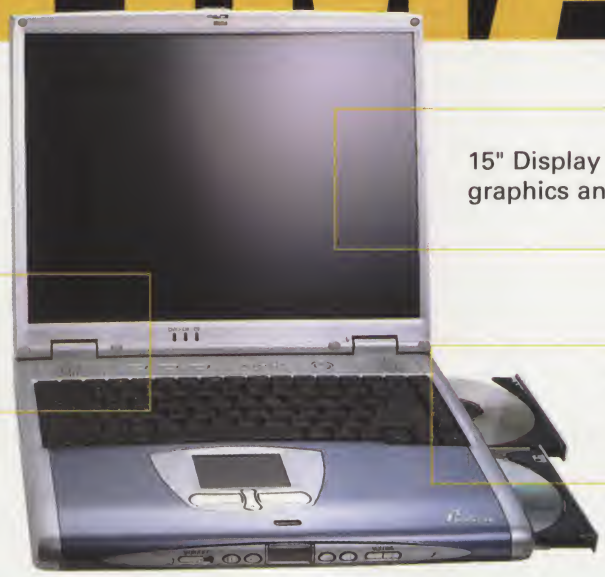

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[1]2X Minimum, [2]10X Minimum, [3]Download speeds limited to 53Kbps. Upload speeds are less. Actual data speeds will vary depending on line conditions. [4] Total HD accessible capacity may vary depending on operating environment. ©2002 by ProStar Computer Inc. All rights reserved. Intel, the Intel Inside logo and Pentium are registered trademarks, Intel SpeedStep Technology and Celeron are trademarks of Intel Corporation. All other companies and product names are trademarks of their respective companies. Dealer price is not subject to 30 days money back guarantee program. Opened software and shipping charges are non-refundable. 30-day money back guarantee does not include return freight or shipping and handling charge. Not responsible for photo or typographical errors. Price and terms subject to change without notice.

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- Other Ports: 1P, Ext. Keyboard and Ext. CRT
- Jacks: 1 Headphone and 1 Microphone
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- Carrying Case and AC Adapter
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2293

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HARDWARE

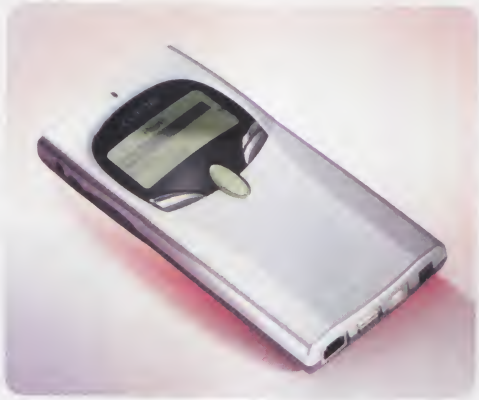
TERAPIN MINE TX2000

The External Hard Drive Evolves

ORGANIZING, TRANSPORTING, AND SHARING ALL your personal data—from snapshots to music—can be tricky, but the $599 Terapin Mine TX2000 can help. Big and complex, yet powerful, the Linux-enabled Mine aims to be your portable data repository and much more. It receives e-mail, shows photos on TV screens, plays MP3s in a pinch, and can even act as an FTP server.

The Mine is not small. Weighing in at 1 pound and roughly the size of a VHS videotape, the device is designed to fit in your briefcase rather than your pocket. Essentially a 10GB hard drive with myriad ports and an LCD, the Mine connects to your PC as a removable hard drive or a networked device.

In addition, the device can connect directly to the Internet via either its Ethernet port or PC Card slot. Once connected, it can retrieve e-mail from your POP3 account, and lets you reply with photos or voice recordings as attachments. (An external microphone is included.) The unit's FTP-server function lets you create accounts from which people can upload or download files.



If the Mine supports your digital camera, you can empty images onto the device and make room for new pictures without a PC. Similarly, you can move MP3 files to an MP3 player directly from the Mine. So far, however, only a few cameras and one MP3 player (Sonicblue's Rio 500) are compatible. Terapin plans on adding drivers for more devices through free upgrades later. Also, the Mine can display photos in a slide show on any television using its composite-video connector.

As it stands, the Mine is less than ideal as a portable device, primarily due to its poor battery life. The unit burned through four AA batteries in only 1 hour and 45 minutes, so plan on using its included AC adapter whenever you're near an outlet.

The Terapin Mine TX2000 is a bleeding-edge gadget nowhere near ready for the mass market. But for adventuresome souls or professional digital photographers, it offers impressive features that will improve as more drivers are added. —*Ken Feinstein*

EDITORS' RATING 6.1
RATED 1 TO 10

< PROS >
Displays photos on a television; FTP-server feature; upgradable firmware

< CONS >
Bulky; heavy; short battery life; limited device support

DIRECT PRICE: $599

Terapin Technology
888-654-0645
www.terapintech.com

Shopper PriceIt!™ 35259
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CANON POWERSHOT S40

Pleasing Shots Plus Portability

CANON U.S.A.'S NEW $799-ESTIMATED POWERSHOT S40 is a sleek and versatile 4-megapixel amalgam of the semi-pro PowerShot G2 and the ultracompact Digital Elph series. With its top-notch image quality, the S40 will appeal to both the style- and function-conscious.

At 11.1 ounces with battery and CompactFlash card installed, the S40 has a solid feel and sturdy construction. Its use of a sliding lens cover and a retractable 3x zoom lens is a departure from Canon's previous digicam models.

We do have a couple of design complaints, however. The optical viewfinder doesn't show you enough of the picture you'll capture, and the view is slightly distorted. It's also impossible to change the battery and media with the camera on a tripod.

Still, we loved this camera's easy operation. Frequently used settings are easily accessible through its buttons. The command dial is littered with abbreviations and icons, but we appreciated it more with each use. Shooting modes are quickly accessible, and Canon divides them into two categories: an Image Zone and a Creative Zone. The Image Zone offers seven preset modes, and the Creative Zone includes the programmed auto, aperture-priority, shutter-priority, and manual-exposure modes.

We were equally impressed by the S40's fast performance. Virtually no shutter lag results when you take your shot, even with the flash. The included rechargeable lithium-ion battery provides at least a couple of hours of shooting. Plus, the bundled charger juices up the battery in only 80 minutes.

The camera produced terrific images, evident from the accurate exposures of its evaluative metering system to the impressive degree of detail visible at its 4-megapixel resolution. Even in very low light, detail was remarkable, and noise levels remained low. Flash-lit photos were generally well-exposed, with accurate and relatively sharp focus.

We were hard-pressed to find any significant chromatic aberrations, even in heavily backlit portraits or high-contrast shots. The Canon PowerShot S40 competes well with other compact 4-megapixel cameras and merits serious consideration. —*Michael Shapiro*

EDITORS' RATING 8.3
RATED 1 TO 10

< PROS >
Excellent image quality; high resolution; minimal shutter lag; stylish; easy to use

< CONS >
Tight, slightly distorted optical viewfinder

MFR. EST. PRICE: $799

Canon U.S.A.
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www.usa.canon.com

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HARDWARE

HP DVD-WRITER DVD100I

High-Speed DVD Burns, But Low Compatibility

HEWLETT-PACKARD'S NEW DVD-WRITER DVD100I IS one of the fastest DVD burners we've seen. Though it can't write to DVD-R or DVD-RW discs, this versatile internal IDE drive supports DVD+RW media and handily outperforms DVD-writing rivals such as QPS's Que DVD-RAM/R and Pioneer's DVR-A03. (The latter is also the mechanism used in Apple's and LaCie's SuperDrive.) The DVD100i also functions as a 12x/10x/32x CD-RW drive and an 8x DVD-ROM reader.

At $499 direct, the DVD100i costs half what the Pioneer DVR-A03 did last spring. Thanks to a series of price drops, however, the DVR-A03 is now available for about $75 less than the HP.

The drive's out-of-box experience is geared to savvy users rather than novices. The multilingual installation guide is barely enough to get you started; you can find a setup video on the software CD, however.

Based on its specs, the DVD100i writes to its native DVD+RW discs at 3.32MB per second (2.4x), more than double the QPS drive's 1.38MB-per-second rate. The speed boost is overshadowed by DVD+RW discs' compatibility issues, however. Sharing data or movies on DVD+RW could be problematic because of the media's low reflectivity; the discs are not consistently readable on drives and movie players that are more than 2 years old. The DVD-R media supported by the SuperDrive and other DVD-RAM/R drives is more palatable to legacy units.

The DVD100i's software bundle should take care of most of your video-capture and disc-creation needs. Sonic Solutions' MyDVD is the core program provided for creating DVD-movie discs. It even lets you record directly to a DVD+RW disc from a digital video source such as a camera, but your system needs to have an 800MHz or faster CPU.

HP offers a one-year warranty on the DVD100i, and tech support is available via a toll call from 8 a.m. to 8 p.m. (ET).

The HP DVD-Writer DVD100i is great for backing up your system or creating DVD movies. But if you want to author DVDs for playback on older DVD players, opt for a DVD-RW drive or wait for DVD+R recorders to start shipping. —*Jon L. Jacobi*

EDITORS' RATING 7.3
RATED 1 TO 10

< PROS >
Faster than competing DVD writers; writes to CD-R/CD-RW, as well as DVD+RW

< CONS >
DVD+RW media may not be readable on older drives/players

DIRECT PRICE: $499

Hewlett-Packard
800-752-0900
www.hp.com

Shopper PriceIt!™ 35275
For real-time pricing, go to *shopper.com* and enter number.

VISIONEER ONETOUCH 8920 USB

A Frugal Flatbed For Basic Scanning

FLATBED SCANNERS HAVE BECOME MUCH THINNER over the years, but Visioneer's OneTouch 8920 USB bucks this trend—the $149.99 scanner is as thick as a telephone directory. And though Visioneer's popularly priced flatbed is easy to use, inexpensive, and versatile, its image quality will disappoint most discerning users.

The OneTouch is compatible with PCs running Windows 98 and later (Macs are not supported), and it comes with its own USB cable. The bundle also contains ScanSoft's PaperPort Deluxe 7.0 document-archiving program and TextBridge Pro 9.0 OCR program, as well as Visioneer's Scan Manager Pro control software and Adobe's Photoshop Elements. Run the installer, and you're ready to scan.

Using the OneTouch is supremely easy. Seven buttons line the front edge, with several programmed to send scans directly to e-mail, a fax modem, a printer, or the OCR software. You adjust scan settings with Scan Manager Pro, which is rich in features yet easy to use.

In our tests, the OneTouch delivered blazing speed. It captured color images in 17.5 seconds and gray-scale in 12.5 seconds—faster than comparable scanners. It captured slides in 33.4 seconds and negatives in 43.8 seconds. The OneTouch 8920 can grab images at resolutions of up to 1,200dpi by 4,800dpi, at a color depth of up to 48 bits.

Despite the impressive specs, scan quality was disappointing. Our test images looked crisp and preserved shapes and details well, but color scans were plagued with serious color-tracking errors. Gray-scale scans fared worse: Images looked out of focus and lacked detail. The OneTouch can't accommodate legal-size paper, either, though it does have a built-in adapter for scanning slides and negatives.

Visioneer backs the OneTouch with a one-year warranty. Phone support, available weekdays during business hours, is a toll call, but Visioneer's Web site provides FAQs, drivers, manuals, and e-mail support.

The Visioneer OneTouch 8920 USB is a good package for the price, but its scan quality falls a bit short of the mark. Users who need professional-level or legal-size scans should look elsewhere. —*Dan Littman*

EDITORS' RATING 6.3
RATED 1 TO 10

< PROS >
Fast; easy to use; built-in transparency adapter; hefty software bundle

< CONS >
Mediocre image quality; large size; can't scan legal-size pages

DIRECT PRICE: $149.99

Visioneer
888-229-4172
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HARDWARE

VISIONTEK XTASY 6964

A New Pacesetter in Fast, Furious Graphics

THE NVIDIA GEFORCE3 TITANIUM 500 (TI 500) GPU IS the newest big dog in 3D graphics, and one of the first cards to put it into play is VisionTek's $349 Xtasy 6964. The new nVidia chipset is loaded with 3D steroids, making the costly Xtasy 6964 the latest "fastest of the fast" among graphics accelerators.

Installation is a snap—just drop the 4x AGP board into your PC's AGP slot, then install the software and drivers. VisionTek provides a huge step-by-step chart to walk you through the process. Driver installation is automatic, leaving you merely to select the appropriate resolution and color depth. The card is compatible with Windows 95 OSR 2, 98, Me, 2000, NT, and XP.

nVidia claims the new chip provides 1.5 times more punch than the original GeForce3. We didn't quite find that to be the case, but the Xtasy 6964 did come close in our tests. On MadOnion.com's 3DMark2001 Pro trials, run at 32-bit color and 1,600-by-1,200 resolution, the Xtasy 6964 delivered a 35 percent advantage over the older GeForce3. Quake III Arena test speeds were also 35 percent faster, and on eTesting Labs' 3D WinBench 2000 1.1, the Xtasy 6964 scored almost 34 percent faster. Don't look for any 2D-graphics improvement, however—the two cards had nearly identical 2D performance.

We were surprised to discover that installing the newer nVidia driver on our older GeForce3 card also boosted performance on the old card. Taking that into consideration, the Xtasy 6964's advantage on 3DMark2001 Pro dropped to just 15 percent, on Quake III Arena to a little more than 18 percent, and on 3D WinBench 2000 to just 24 percent.

The Xtasy 6964 carries a lifetime warranty and is backed with toll-free technical support, available only on weekdays during business hours. No games come bundled with the card.

The VisionTek Xtasy 6964 demonstrates that the new technology in the GeForce3 Ti 500 is clearly superior to that of the original GeForce3. Current GeForce3 owners can enjoy a performance boost from the new driver alone and save a bundle, however.

—Bill O'Brien

EDITORS' RATING 7.2
RATED 1 TO 10

< PROS >
Excellent 3D performance

< CONS >
Expensive; no increase in 2D performance over GeForce3

LIST PRICE: $349

VisionTek
800-726-9695
www.visiontek.com

Shopper PriceIt!™ 35272
For real-time pricing, go to shopper.com and enter number.

ATI RADEON 7500

Affordable Accelerator For Dual Displays

THE $199.99 RADEON 7500, THOUGH NOT ATI'S MOST powerful 3D-gaming creation, is yet another attractive option in the company's long line of strong graphics cards. This able accelerator offers several advantages, most notably dual-display support and an affordable price. Gamers and graphics enthusiasts may find the 7500's speed not quite satisfying, however.

The card comes equipped with both a 15-pin VGA connector and a DVI-I connector for digital flat-panel displays, and you can also hook up two VGA monitors simultaneously. An S-Video-out port lets you connect the Radeon to a television.

Installation is easy: Just slide the Radeon 7500 into an AGP slot, install the software, and you're ready to roll. A multimonitor utility, HydraVision, lets you specify on which monitor you want a new window to appear or a new application to run.

The Radeon 7500 graphics processor gives the card impressive processing power. It supports a maximum resolution of 2,048 by 1,536 at a 75Hz refresh rate, 1,280 by 1,024 at 100Hz, and 1,024 by 768 at an amazing 200Hz. The Radeon 7500 comes with 64MB of DDR memory, which is plenty for most uses.

That said, the Radeon 7500 isn't the fastest display adapter on the market. The card was trumped at every turn in our performance tests by the slightly more expensive Hercules 3D Prophet III Titanium 200, which is built around nVidia's GeForce3 Titanium 200 architecture. The Hercules scored better in each of our tests at all resolutions, including our Quake III Arena test, MadOnion.com's 3DMark2001 Pro, and eTesting Labs' 3D WinBench tests.

ATI backs its card with a three-year limited warranty. The company's neatly organized Web site offers OS- and product-specific support via a voluminous FAQ library or a search engine. Telephone support is less satisfactory; it's neither available around the clock, nor toll-free.

The ATI Radeon 7500's dual-display output capabilities can be a boon for users who need lots of screen area to work in, but most gamers will find its 3D speed subpar.

—Erik Sebellin

EDITORS' RATING 7.6
RATED 1 TO 10

< PROS >
Affordable; dual-display capability

< CONS >
Sluggish 3D performance

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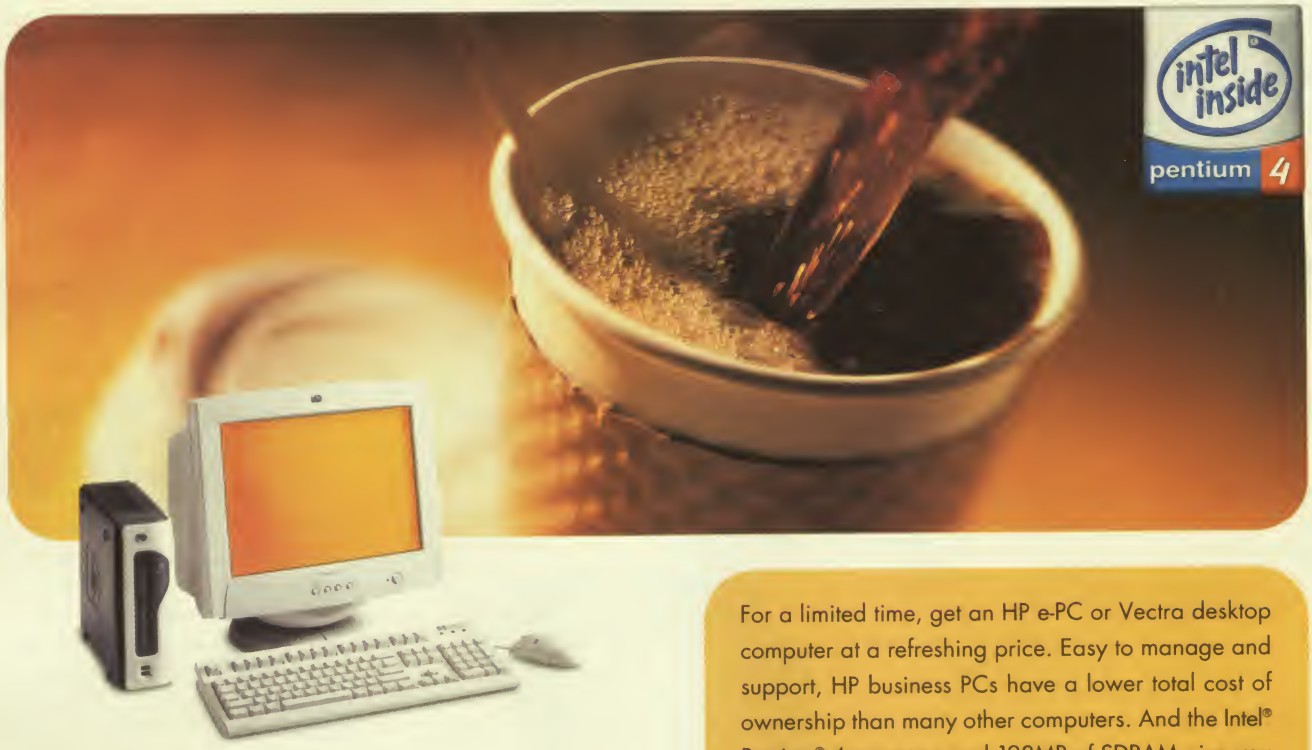

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HARDWARE

BELKIN NOSTROMO N50 SPEEDPAD

Gaming Beyond The Basic Keyboard

WHEN YOU HEAR THE NAME BELKIN, AN ARRAY of products comes to mind: everything from USB hubs to mouse pads. Although Belkin isn't known for its gaming products, the company has reinvented the keyboard for gamers with the $29.99 Nostromo n50 SpeedPad.

The sleekly ergonomic left-handed device certainly looks responsive. While traditional keyboards have their keys in slightly misaligned rows, the SpeedPad's 10 vertically aligned keys (two rows of five) are more intuitive and easier to press in a pinch. Belkin has also added a large thumb pad built on an eight-direction axis. Using this directional pad lets you avoid relying on your standard keyboard's arrow keys or W, A, S, and D keys for movement. The inclusion of a throttle wheel on the SpeedPad also highlights Belkin's attention to detail.

Installation is straightforward: Simply plug the SpeedPad into your PC's USB port, boot up your machine, and install the software. The programming software included is a true gem. A Profile editor maps out all the keys and allows you to assign custom keystrokes and macros for your favorite games to any key on the SpeedPad. Belkin's Loadout Manager runs in your system tray and associates the games you play with their individual key profiles. Launch a game, and the SpeedPad automatically has your key profile loaded. Belkin also includes 33 prebuilt profiles for many popular game titles to get you up and running in no time.

Serious gamers may want to check out these profiles in Belkin's profile-editing software to make adjustments to key assignments. We did have problems getting our profiles to load automatically under Windows XP, however. Belkin is aware of the problems and plans to address them in a future software upgrade.

The gamer's quest for a workable keyboard replacement is finally over. Belkin's Nostromo n50 SpeedPad lives up to its name by taking the awkward standard keyboard interface and streamlining it into something gamers can use effectively and efficiently.

—*Pete Vega*

EDITORS' RATING 8.0
RATED 1 TO 10

< PROS >
Ergonomic design; powerful software for key customization; excellent keyboard replacement

< CONS >
Loadout Manager software doesn't function properly under Windows XP

DIRECT PRICE: $29.99
Belkin Components
800-223-5646
www.belkin.com

Shopper PriceIt!
35254
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LINKSYS ETHERFAST WIRELESS AP + CABLE/DSL ROUTER WITH 4-PORT SWITCH

One-Shot Wireless Networking

THE $199 LINKSYS ETHERFAST WIRELESS AP + CABLE/DSL Router with 4-Port Switch is designed for those who need to share a broadband cable or DSL connection across a small network containing cabled Ethernet and wireless 802.11b segments. Handily merging a four-port switch with an 802.11b wireless access point, a cable/DSL router, and a hardware firewall, the EtherFast seeks to provide convenience and speed to would-be network builders by replacing several pricey pieces of equipment.

The unobtrusive design has four sturdy legs supporting a rounded, rectangular, black-and-purple case. The wireless access point acts as a DHCP server and assigns IP addresses to PCs on the network. It also supports WEP encryption and claims a top operating range of 300 feet indoors. The EtherFast's 10/100mbps Ethernet switch has four LAN ports, plus a WAN jack for a modem.

Though the bundled documentation was in some spots confusing, the setup went smoothly. To get started, simply connect the router to its power source, the cable/DSL modem to the WAN port, and the installation PC to one of the LAN ports. Finally, set the TCP/IP settings for the installation PC's network card to obtain an IP address automatically, then reboot. You then configure the EtherFast using your Web browser.

Performance was great. We clocked 92.5mbps on the Ethernet connection and 4.2mbps wirelessly in our tests. Wi-Fi compatibility was also seamless. You can set up the router to filter Internet access (handy for family networks), allow remote administration, keep a log of all Internet sites visited, and more.

The EtherFast comes with a one-year warranty. Toll-free phone support is available 24/7, excluding major holidays, for the life of the product. The Linksys Web site offers firmware updates, a knowledge base, and FAQs.

Linksys could have done a better job with its setup documentation, but for the price, the EtherFast wireless cable/DSL router is still a good solution for small- and home-office users looking to combine wireless and cabled network segments with broadband Internet access.

—*Mark Henricks*

EDITORS' RATING 7.3
RATED 1 TO 10

< PROS >
Smooth installation; excellent performance; 24-hour phone support

< CONS >
Sometimes-confusing documentation

MFR. EST. PRICE: $199
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MOBILE

ACER TRAVELMATE 744LCF

A Portable Hot Rod With Street-Smart Security

ACER AMERICA'S TRAVELMATE 744LCF, POWERED BY A MUSCULAR 1.2GHz Pentium III-M engine, is one of the best-performing desktop-replacement notebooks we've seen. At $2,499, it has the speed and most of the features you'd expect from a notebook at this price, and Acer tops off the configuration with a unique fingerprint reader that ensures only the intended user can access protected files.

The TravelMate 744LCF is certainly expansive and offers plenty of flexibility. Its substantial chassis has room to hold a 4,200rpm 30GB hard drive, a built-in floppy drive, and a swappable bay stuffed with a DVD/CD-RW combo drive. The laptop also packs a roomy 15-inch TFT display. A hump at the back of the sparkly magnesium-alloy lid accommodates a set of speakers; the notebook swells to 1.9 inches high at that point. All these features add up to a package that tips the scales at 7.3 pounds (8.2 pounds with the AC adapter) and measures a portly 1.5 inches by 12.8 inches by 10.5 inches (HWD).

Although its speakers face away from you once the lid is open, they pump out loud sound, certainly enough to do justice to your DVD movies. The Acer's display does its share, too. Powered by an ATI Mobility Radeon M6-SVGA graphics controller with 16MB of its own memory, the screen showed none of the ghosting that often plagues LCDs. The TFT's native 1,400-by-1,050 resolution felt a bit crowded; we preferred 1,280 by 1,024 instead. For a 15-inch unit, that resolution is a good midpoint between a virtually impossible-to-read 1,600 by 1,200 and a space-wasting 1,024 by 768 pixels.

The TravelMate 744LCF may have the makings of an entertainment center, but it gets serious when the workday starts. Our evaluation model came to us running Windows 2000 and decked out with 128MB of system memory. In our SYSmark 2001 tests, the Acer far outpaced two notebooks with twice the RAM. It one-upped the Dell Inspiron 4100, which comes equipped with the same processor and OS, by 12 percent, and it ran 5 percent faster than the comparable HP Omnibook 6100, which has a slower 1.13GHz CPU.

The only test in which the Acer trailed behind the others was in battery life. By notebook standards, 2 hours and 48 minutes is good, but it was no match for the Dell's 3 hours and 38 minutes, let alone the HP's truly impressive 4 hours and 22 minutes. When away from a power outlet, you may want to swap out the DVD/CD-RW drive for a $99 second battery.

The TravelMate 744LCF can certainly handle major mobile-computing needs, but it falls short when it comes to luxury touches and refinement of details. Specifically, we weren't sold on the notebook's keyboard and controls. The power button sits on the left edge, where it's exposed to accidental poking by stray objects in your briefcase. Also, the keys have a tendency to sag when you press down, and they don't deliver good feedback. On the other hand, most keys are big, including the all-important Backspace, and a scroll button complements the touch pad and standard left- and right-click buttons.

We couldn't fault the solid connectivity options. The TravelMate 744LCF comes with Ethernet, modem, dual USB, and PS/2 ports, as well as two Type II (one Type III) PC Card slots. One of its two memory slots is also free. (The system supports up to 1GB of memory.)

Though lacking an integrated Wi-Fi transmitter like the Omnibook 6100's and the Inspiron 4100's, what sets this TravelMate apart from other notebooks is its fingerprint reader. This extra security device biometrically locks your files using your fingerprints and protects them with included encryption software.

Acer covers the notebook with a short warranty—just one year—and a year of toll-free, around-the-clock technical support. The company's Web site provides e-mail access to technicians and extensive documentation on the TravelMate 744LCF, as well as several FAQs.

With its fiery performance and solid features, the Acer TravelMate 744LCF is a powerful desktop replacement. But unless security is tantamount, its uninspiring battery life, keyboard, and controls may force you to look elsewhere.

—Dan Littman

EDITORS' RATING 8.1
RATED 1 TO 10

< PROS >
Fast; ATI Radeon graphics; built-in fingerprint security

< CONS >
Comparatively short battery life; brief warranty; poor keyboard/control design

MFR. EST. PRICE: $2,499

< SPECS >
1.2GHz Pentium III-M; 128MB SDRAM; 30GB hard drive; DVD/CD-RW combo (4x/4x/24x CD, 8x DVD); 15-inch TFT; Windows 2000

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ANYONE WHO HAS TOTED A 10-POUND NOTEBOOK CAN TELL YOU that even a few ounces make a big difference to frequent flyers. Others who have had their notebook battery fizzle out midflight insist that battery power is more important than weight. Fujitsu PC's $2,049 LifeBook B Series properly addresses one of these needs: Its slight 2.9-pound base weight and tappable touch screen might make you think it's a handheld, but the LifeBook B is actually one of the lightest full-blown Windows laptops around. Unfortunately, its tiny primary battery didn't stand up well in our battery-life test.

The 1.3-by-9.9-by-8.5-inch (HWD) LifeBook B is so small that it can slip into the outside pocket of many travel bags, making it easy to remove and display at security checkpoints. Of course, carrying a laptop this way could make you a prime target for pickpockets, but the LifeBook B promises to frustrate any would-be thief with its integrated security features. Above its tiny keyboard, the system includes four user-programmable buttons that function as a security password panel. You can choose a password from up to 800,000 different numeric combinations and program the notebook to request it each time at bootup.

Once you're up and running, these buttons double as programmable quick-launch keys for your favorite programs. For extra protection, the LifeBook B has an embedded smart-card reader in one of its two Type II (one Type III) PC Card slots. This reader enables you to insert and use smart cards that store data such as credit-card numbers, numerical keys, or electronic money. To use this feature, you'll have to install an optional $25 Smart Card Holder in the Fujitsu's PC Card slot.

During rigorous testing, the LifeBook's tiny three-cell primary battery lasted a mere 88 minutes in CNET Labs' battery-drain test, a showing that's substandard even when compared with other ultra-*lights* such as the Compaq Evo N400c and the Dell Latitude L400. You can, however, opt to extend your battery life—and the system's girth by 0.8 inch—with the optional six-cell battery ($109).

Beyond battery power, the LifeBook B was satisfactory in other performance tests. Its 700MHz Pentium III-M processor, sufficient 128MB of memory, and 8MB ATI Rage Mobility PCI graphics chip proved adequate for most business tasks and helped it stay in step with both the Compaq and the Dell in CNET Labs' performance tests. The notebook's 20GB hard drive should also provide plenty of storage room for data pack rats on the go.

The Fujitsu's small chassis doesn't leave room for any internal secondary drives. An included external floppy drive connects easily enough to one of the system's two USB ports, but the optional external CD-ROM drive ($128) is a more complicated affair. The CD drive requires you to insert a PC Card with a proprietary CD connection port into one of your PC Card slots, then connect a cable from the port to the drive itself. Thankfully, both the PC Card and the cable are included in the cost of the drive. The notebook's small size does accommodate, along with its USB and PC Card connections, ports for a 56kbps modem, Ethernet, IrDA, VGA, headphone, and microphone. You can add PS/2, parallel, or serial ports by attaching an optional port replicator ($149).

A diminutive chassis also limits keyboard size and screen space. While small, the Fujitsu's 10.4-inch active-matrix display includes some novel features. First, it functions as a touch screen like that of a PDA, enabling you to use the stylus that pops out of the left side to control the cursor and perform other tasks. Or you can simply use the traditional pointing stick and set of mouse buttons located beneath the keyboard. Second, the display has an antireflective coating that Fujitsu claims will reduce the glare that makes your screen all but unreadable in sunlight. Nonetheless, we still had problems reading the screen in bright outdoor light.

Fujitsu's lengthy three-year parts-and-labor warranty and unlimited 24/7, toll-free tech support are a home run in our book. You can also find tech-support answers using the company's Service Assistant information database or by chatting live with a Fujitsu tech-support rep.

Equal parts PDA and notebook, the Fujitsu LifeBook B Series will interest highly mobile users seeking the full Windows experience in a superportable package. But its poor battery life is sure to put a damper on your productivity.

—Stephanie Bruzzese

EDITORS' RATING 6.4
RATED 1 TO 10

< PROS >
Compact, light; touch-screen LCD; long warranty; unlimited phone support

< CONS >
Short battery life; complex external CD hookup; ineffective antiglare display coating

DIRECT PRICE: $2,049

< SPECS >
700MHz Pentium III-M; 128MHz SDRAM; 20GB hard drive; 10.4-inch TFT; Windows XP Professional

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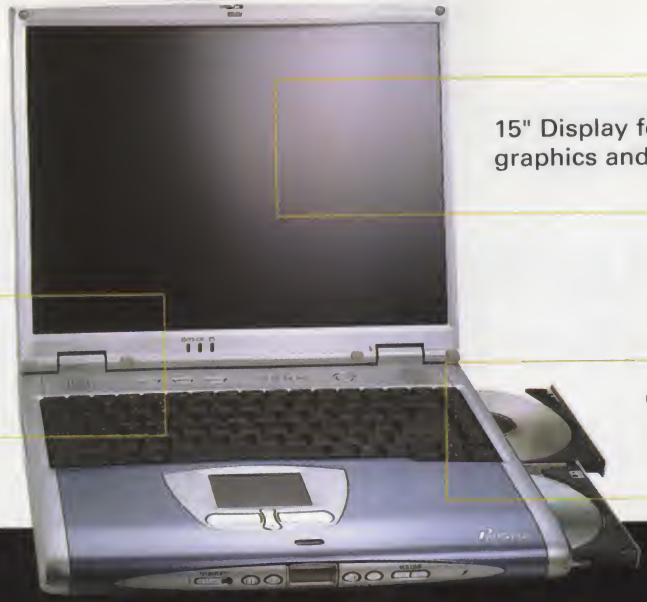

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Features

- 512KB On-Die L2 Cache
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- External 64MB DDR SGRAM Video Memory
- 3.5" 1.44MB FDD
- 3D Surround Sound (SPDIF 5.1CH output for DVD)
- 2 Built-in Stereo Speakers and 1 Built-In Microphone
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MOBILE

TOSHIBA TECRA 9000

Fast, Luxury Laptop For the Executive Set

TOSHIBA'S NEW $3,199 TECRA 9000 NOTEBOOK IS BUILT TO APPEAL TO the inner executive in all of us. It's an eye-catcher that resembles a luxury coupe with a sleek, silvery chassis, well-appointed interior, and fast engine. Not surprisingly, the Tecra 9000 has a sticker price to match its opulent features, and its low power mileage means you may need to spring for the optional second battery.

Nonetheless, it is easy to see how even the most jaded aficionado of fancy toys could fall for the Tecra 9000's look and feel. The notebook's all-silver magnesium case is attractive and features a lip that lends definite shark-like lines to the front edge. The system weighs a trim 5.5 pounds (6.5 pounds with AC power supply), and is a sleek 1.5 inches by 12 inches by 10.75 inches (HWD).

Even better, Toshiba has outfitted the Tecra 9000 with conveniences such as integrated Bluetooth and Wi-Fi (IEEE 802.11b), with an on/off button for both wireless technologies. More modern components line the notebook's outside edges, including a versatile DVD/CD-RW combo drive in a modular bay, a Secure Digital card slot, and two USB, one FireWire (IEEE 1394), and one S-Video ports.

Under the Tecra 9000's lid sits a bright 14.1-inch LCD. Its native resolution is a bit low at 1,024 by 768 pixels but, thanks to the S3 SuperSavage IXc graphics controller with 16MB of memory, a virtual-screen feature lets you scroll around effortlessly in a 1,600-by-1,200 space. The lid's wide central hinge makes room on either side for speakers, which are exposed even when the notebook is closed.

A quiet, responsive keyboard carries just a few compromises, such as inconveniently small Tab and Esc keys. The eraser-like AccuPoint II pointing device, nestled amid the keys, comes with four programmable buttons in the palm-rest area, enabling you to customize clicking, scrolling, and other navigational maneuvers.

The notebook also offers one Type III or two Type II PC Card slots, and 56kbps modem, Ethernet, and PS/2 ports. An external USB floppy drive costs an extra $50 if you buy it with the notebook (or $99 later), but with a combo drive, Secure Digital slot, and ample 30GB hard drive, you might not need it. You also get the standard headphone and microphone jacks, plus front-edge controls for volume and an infrared port.

The Tecra 9000's beauty runs more than skin-deep; it's also a very fast machine. We've tested several notebooks powered by Intel's 1.2GHz Pentium III-M processor, and the Toshiba's overall score of 139 on SYSmark 2001 ties that of bigger portables like the IBM ThinkPad A30p for top performance. Both systems run at 1.2GHz with 256MB of RAM, but the IBM ran Windows XP Professional and had 32MB of video memory, while the Toshiba relied on Windows 2000 and had only 16MB of graphics RAM. By comparison, Dell's Inspiron 4100, with specs nearly identical to those of the Tecra 9000, hit only 113 on SYSmark 2001's overall benchmark, making the Toshiba 23 percent faster.

The one area in which the Tecra 9000 loses its luster is in battery-life tests. The notebook barely lasted more than 2 hours, while the ThinkPad A30p managed to hold on 33 minutes longer. (Both notebooks have a 10.8V/3.6Ah power pack.) The Inspiron 4100 chugged past the Toshiba, outpacing it by 95 minutes. If battery life is crucial, consider buying a $169 second battery for the Tecra 9000.

On a positive note, Toshiba helps you take very good care of the Tecra. The company's three-year warranty includes three-business-day repair service and live tech support, which is available 24/7 on a toll-free line. The profusion of manuals and documentation provided with the system teaches beginners everything they need to know about the notebook and has plenty of wisdom for veterans, too. Plus, Toshiba's Web site is loaded with helpful information.

The Toshiba Tecra 9000 is a winner if your work keeps you on your feet, whether strolling from desk to desk—where Bluetooth and Wi-Fi make wireless local networking simple—or hopping on and off flights. But the Tecra 9000's short battery life could be a real drawback, and its price means you'll definitely want your employer to pick up the tab.

—Dan Littman

EDITORS' RATING 7.9
RATED 1 TO 10

< PROS >
Fast; built-in Wi-Fi, Bluetooth; great support

< CONS >
Expensive; short battery life

DIRECT PRICE: $3,199

< SPECS >
1.2GHz Pentium III-M; 256MB SDRAM; 30GB hard drive; DVD/CD-RW combo (8x/4x/24x CD, 8x DVD) 14.1-inch TFT; integrated Ethernet; Windows 2000

Toshiba America Information Systems
800-867-4422
www.toshiba.com

Shopper Price It! 35284
For real-time pricing, go to *shopper.com* and enter number.

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The AMD Athlon™ XP processor with QuantiSpeed™ Architecture[a] is powering the next generation in computing platforms while delivering the ultimate performance for Microsoft's next generation operating system, Windows® XP. AMD worked diligently with Microsoft to ensure the AMD Athlon™ XP processor was compatible, easy to use, and optimized to run Windows® XP.

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QuantiSpeed™ Architecture[a]
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Designed to run flawlessly on the world's most popular software

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The new AMD Athlon™ XP processor features QuantiSpeed™ Architecture[a]. You can now enjoy efficient multitasking when using multiple peripherals, quickly edit home movies, digital photos, boost software performance and burn CDs at lightning speed with fast file downloads. With the new and improved 3DNow! Professional technology, download files and surfing the 'Net while getting Crystal-clear audio enhances digital music and video experiences. Furthermore, you can now make gaming opponents over the 'Net wishing they had an AMD Athlon™ XP processor.

c|net ZDNet BEST BUY Editors' Choice

a AMD Athlon XP Processor 1700+ with QuantiSpeed™ architecture outperforms competitive 1.7GHz PC processors. QuantiSpeed™ architecture operates at 1.47GHz
AMD Athlon XP Processor 1800+ with QuantiSpeed™ architecture outperforms competitive 1.8GHz PC processors. QuantiSpeed™ architecture operates at 1.53GHz
AMD Athlon XP Processor 1900+ with QuantiSpeed™ architecture outperforms competitive 1.9GHz PC processors. QuantiSpeed™ architecture operates at 1.60GHz
AMD Athlon XP Processor 2000+ with QuantiSpeed™ architecture outperforms competitive 2.0GHz PC processors. QuantiSpeed™ architecture operates at 1.67GHz

Atlas Xelerator XP

$559 XM1401

AMD Athlon XP

XP3000
Athlon XP 1700+ Processor with QuantiSpeed™ architecture

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- 200/266MHz FSB and UDMA-100 Support
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- 56X CD-ROM
- Trident Blade 3D Shared AGP
- Lucent PCI 56K Voice Modem and 10/100 NIC
- PCI 3D Wavetable Stereo Sound
- *Atlas 440W* 2.1 Speakers w/Subwoofer
- Deluxe Windows 98 Keyboard
- Deluxe Mouse w/Wheel
- Microsoft Windows XP Home Edition
- Sun Micro StarOffice
- AMD Certified Power Supply

Athlon XP 1800+ with QuantiSpeed™ architecture	$569 XM1402
Athlon XP 1900+ with QuantiSpeed™ architecture	$599 XM1403
Athlon XP 2000+ with QuantiSpeed™ architecture	$669 XM1404

$1,089 XM2404

POWERED BY DDR MEMORY AMD Athlon XP

XP6000
Athlon XP2000+ Processor with QuantiSpeed™ architecture

- New VIA KT266A DDR Chipset
- 200/266MHz FSB and UDMA-100 Support
- DDR PC2100 and 4X AGP Support
- 256MB PC2100 (266MHz) DDR RAM
- 60 GB UDMA-100 Hard Drive
- 16X DVD-ROM
- 24X10X40 CDRW Drive
- Nvidia GEFORCE 4 MX 440 3D DVD 64MB DDR
- Creative Labs Modem Blaster PCI Voice Modem
- SoundBlaster PCI 128 4-Channel 3D Wavetable
- MLI-452 4.1 Ch Speakers w/Subwoofer
- 17" 0.27DP OSD Monitor
- Deluxe Windows 98 Keyboard
- Deluxe Mouse w/Wheel
- Microsoft Windows XP Home Edition
- Sun Micro StarOffice
- 350W AMD Certified Power Supply

Athlon XP 1700+ with QuantiSpeed™architecture	$ 979 XM2401
Athlon XP 1800+ with QuantiSpeed™ architecture	$ 989 XM2402
Athlon XP 1900+ with QuantiSpeed™ architecture	$1,019 XM2403

$1,219 XM3402

POWERED BY DDR MEMORY AMD Athlon XP

XP8000
Athlon XP 1800+ Processor with QuantiSpeed™ architecture

- New nForce TwinBank DDR Chipset
- 200/266MHz FSB and UDMA-100 Support
- DDR PC2100 and 4X AGP Support
- 256MB PC2100 (266MHz) DDR RAM
- 80 GB UDMA-100 Hard Drive
- 16X DVD-ROM
- Nvidia GEFORCE 4 Ti 4400 3D DVD 64MB DDR
- nForce 10/100 Ethernet NIC and 56K Modem
- nFoce APU 3D Dolby Digital 5.1 Certified Sound
- Creative Labs Inspire 5.1 5300 Speakers w/Subwoofer
- 19" 0.25DP OSD Monitor
- Microsoft Internet Keyboard
- Microsoft Intelli Mouse w/Wheel
- Microsoft Windows XP Home Edition
- Sun Micro StarOffice
- AMD Certified Power Supply

Athlon XP 1700+ with QuantiSpeed™ architecture	$1,209 XM3401
Athlon XP 1900+ with QuantiSpeed™ architecture	$1,249 XM3403
Athlon XP 2000+ with QuantiSpeed™ architecture	$1,309 XM3404

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MOBILE

MOTOROLA V200 PERSONAL COMMUNICATOR

Carry a Compact Communication Tool

MOTOROLA'S $299 V200 PERSONAL COMMUNICATOR for CDMA networks is a more mature-looking and -functioning version of its GSM cousin, the V100. This sleek, charcoal-gray cell phone, two-way messenger, and Web-surfing device operates only with Verizon Wireless plans and aims to cover all your mobile communication needs.

The V200 mimics its predecessor's clamshell design, including a built-in carrying case that hooks the 6.2-ounce device to your belt. The V200 has a new QWERTY keyboard that's not particularly tactile but is nonetheless easy to use. In addition, a circular menu button replaces the former plus-sign (+) button for navigating and accessing the phone's features. While we like the new keyboard layout, we miss the inclusion of a dedicated Backspace key, and we did find the V200's user interface confusing at times.

The phone has no earpiece, so you'll need to use the included headset to talk. The V200 does have an impressive speakerphone, however. The device boasts plenty of other features as well, including voice dialing, a voice recorder, a 400-entry phone book, programmable keyboard shortcuts, two-way SMS, and wireless Web access.

The V200 isn't a true e-mail device unless you're using the wireless Web. That said, the additional e-mail functions make Web access a must-have since you can check and send e-mail from Yahoo, AOL, and POP3 accounts. The V200 also supports two-way SMS, which lets you send and receive text messages up to 160 characters in length.

Motorola claims up to 140 hours of standby time for the V200, which we were able to duplicate, and a little more than 2 hours of talk time. (We eked out 3 hours in our tests.) Call quality in the San Francisco Bay area was consistently clear, audible, and trouble-free.

The Motorola V200 Personal Communicator's updated speakerphone and POP3 e-mail access are alluring, especially when you factor in the $100 rebate from Verizon, but some may find its initial lofty price tag off-putting.

—Molly Wood

EDITORS' RATING 6.4
RATED 1 TO 10

< PROS >
Speakerphone; solid battery life; POP3 e-mail support

< CONS >
Sometimes-confusing interface; no Backspace key

MFR. EST PRICE: $299

Motorola
800-331-6456
www.motorola.com/v200

Shopper Price It!™ 35262
For real-time pricing, go to shopper.com and enter number.

TOSHIBA SD-P1500

Home Theater Wherever You Go

cnet Editors' Choice

TOSHIBA AMERICA'S NEW $1,099 SD-P1500 PORTABLE DVD player builds on the precedent set by its previous model, the SD-P1000, by expanding the screen and tweaking a few features. It lacks the SD-P1000's progressive-scan capabilities, but it's still a fantastic choice for watching movies on the road, or even in your home theater.

By itself, the SD-P1500 is an average-size portable DVD player—until you strap on the battery pack. The pack adds 1.1 pounds to the package, raising the combined unit to 2.9 pounds and doubling its size. Disappointingly, for all its extra heft, the lithium-ion battery lasts barely more than 3 hours per charge.

Much more impressive is the display. The 234-by-480-pixel, 16-to-9-aspect-ratio screen measures 8 inches diagonally, giving you a lot of picture, and the built-in antialiasing gives this player the best video of any portable DVD player on the market. You'll see absolutely no pixelization, even on DVDs that are not 16-to-9-enhanced. Films that are, such as *Brazil*, look great. The display exhibits excellent color balance and no visible artifacts.

The 10-bit video converter not only makes the picture on the SD-P1500's LCD screen look fantastic, but it also does a great job on a much bigger screen. We hooked up the unit to a Toshiba TN50X81 television and a Harman Kardon AVR 20 receiver for home-theater testing; on this setup, *Crouching Tiger, Hidden Dragon* looked and sounded first-rate.

The sound from the built-in speakers, while clear, isn't very loud. We recommend toting headphones. The two headphone jacks let you share the audio with a friend—a nice touch.

The Toshiba SD-P1500 is a great solution for DVD enthusiasts seeking to take their home theater on the road. The only features you might miss are a progressive-scan mode and MP3 playback, but a portable player with a picture this good is hard to beat.

—John Marrin

EDITORS' RATING 8.0
RATED 1 TO 10

< PROS >
Excellent picture quality; 16-to-9 playback capabilities; two headphone jacks

< CONS >
Short battery life; slightly bulky; can't play MP3s

LIST PRICE: $1,099

Toshiba America Consumer Products
800-631-3811
www.toshiba.com

Shopper Price It!™ 35260
For real-time pricing, go to shopper.com and enter number.

MOBILE

IMATION RIPGO

A Mini-CD Player That Also Burns Discs

FIRST, THERE WERE MP3 CD PLAYERS. THEN CAME MP3 mini-CD players that played little 8cm CD-Rs instead of standard 12cm discs. Now, thanks to Imation, we have a MP3 mini-CD player that also doubles as a CD burner. The aptly named $349 RipGo allows you to copy dozens of digital music files from your PC or Mac onto a 185MB mini-CD-R. Unplug the USB cord, and you're out the door with about 3 hours of music.

Once we finished the RipGo's easy installation process, we fired up the bundled full version of Nero Burning ROM and burned a 185MB mini-CD-R with 3 hours' worth of MP3 and WMA files. The RipGo can also burn any other type of file to these small CD-Rs, which can be read by any CD-ROM drive. Filling one mini-CD-R with music or data took 7 minutes on our test PC; the main constraints on speed are the USB transfer rate and 4x writing speed.

Despite its dual burner/player identity, the 8-ounce RipGo has all the characteristics of a portable audio device—albeit not the most compact one—once it's disconnected from the computer. We hit the randomize button, activated the hold switch to lock the device in play mode, and let the RipGo belt out tunes. The unit delivers decent sound quality, and its volume, equalization-preset, shuffle, repeat, play, fast-forward, and rewind controls are all accessible with individual buttons.

We had no complaints about the RipGo's skip protection. Its 8MB buffer delivered skip-free grooves. We were less thrilled with its battery performance, however. The lithium-ion battery took 3 hours to charge, then delivered only 5 hours of playback.

As it stands, the Imation RipGo is a bit pricey, particularly when you consider its relatively short battery life and the lack of a carrying case, belt clip, or external remote. But even without its burning capability, the RipGo blows away earlier MP3 mini-CD players, such as CMC Magnetics' ShellStar CM220. —*Eliot Van Buskirk*

EDITORS' RATING 7.7
RATED 1 TO 10

< PROS >
Easy installation; burns to 8cm mini-CD-Rs

< CONS >
No carrying case, belt clip, remote; short battery life; expensive

LIST PRICE: $349

Imation
888-466-3456
www.imation.com

Shopper PriceIt!™ 35258
For real-time pricing, go to *shopper.com* and enter number.

D-LINK DCF-650W WIRELESS COMPACTFLASH TYPE II CARD

Wi-Fi Works Its Way Into Your Pocket

IF YOU'RE A FAN OF 802.11B (WI-FI) WIRELESS NETWORKing and own a Pocket PC with a CompactFlash slot, get ready to be tempted. The $99 D-Link DCF-650W Wireless CompactFlash Type II Card makes it easy for mobile business users to connect their CompactFlash-ready PDAs to the Internet via Wi-Fi for e-mail or Web browsing. The card's straightforward installation, potent security tools, and easy roaming between networks add to its appeal.

An illustrated Quick Install guide makes setting up the DCF-650W easy. The installation software loads the DCF-650W CompactFlash Card utility in the Pocket PC Settings/System window. Open the utility, and six tabbed windows let you view and set the access, configuration, and security settings. (The DCF-650W supports both 64- and 128-bit WEP encryption.) All the sections are labeled in the clearest language possible.

If you want to use the DCF-650W to access public wireless networks, set the device to Nonspecific ESSID mode. You can then wander through coffee shops, airports, or hotels and use their public access networks to check e-mail or surf the Web. You can also move across access points within your own office. When you associate with an access point using the DCF-650W card, the utility displays the MAC address and ESSID of the access point, the link quality, the signal strength, and the IP address assigned by the DHCP server.

The product works well, but support is spotty. You must send in the registration card within 90 days of purchase to validate the one-year warranty; if you don't, your warranty ends after those 90 days. Tech support is available Monday through Friday from 6 a.m. to 6 p.m. (PT), but it's a toll call. Moreover, the D-Link Web site offers only a manual and FAQ list.

The D-Link DCF-650W Wireless CompactFlash Type II Card makes Wi-Fi on your Pocket PC a breeze. Its simple installation in particular is sure to win fans. —*Rich Brown*

EDITORS' RATING 7.3
RATED 1 TO 10

< PROS >
Compact; easy installation; support for WEP security

< CONS >
Toll-call phone support; must register to activate warranty

DIRECT PRICE: $99

D-Link Systems
800-326-1688
www.dlink.com

Shopper PriceIt!™ 35256
For real-time pricing, go to *shopper.com* and enter number.

SOFTWARE

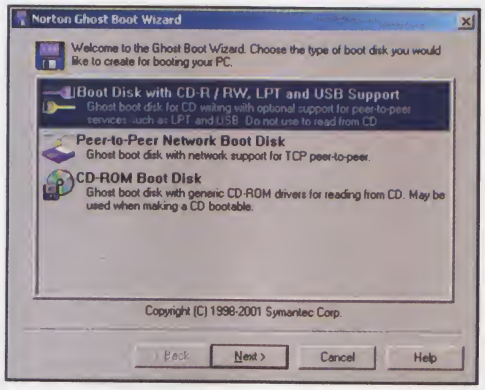
NORTON GHOST 2002

Ghost of a Second Chance

SYMANTEC'S NORTON GHOST 2002 DUPLICATES A disk drive accurately, making it ideal for restoring your entire working environment following a catastrophic crash. It's also useful for migrating your setup and data to a different PC. But because it's difficult to use, Ghost isn't great for day-to-day backups or home use. For those purposes, enlist Roxio's GoBack.

Although many Symantec products are available as free downloads for a 30-day trial period, Ghost isn't. The boxed and downloadable versions each sell for $69.95. Make sure to check out the program's CD-R/CD-RW compatibility list before you buy; Ghost won't work with CD burners connected via a USB cable.

Ghost is designed to make exact images of your hard drive. Because you normally can't back up open files, such as the Windows Registry, you can't make an exact disk image while Windows is running. Ghost instead creates a special boot disk, a floppy disk that boots your computer straight into DOS.



Although Ghost is good for disaster recovery, it's not something you need every day. You have to reboot your computer to use Ghost, unlike competitors such as GoBack, Dantz's Retrospect, NovaStor's NovaBackup, and Veritas Simple Backup. And with Ghost, you select whole drives, not individual folders or files, so your backups are larger.

Ghost's true usefulness comes through when you're making a copy of one computer to load onto another machine, onto another drive on the same computer, or onto removable media, such as CD-RWs. In addition to Windows compatibility, Ghost supports DOS, OS/2, and Linux EXT2 file systems.

The Windows-based restore feature is easy to use. Ghost Explorer looks through the folders and files in a Ghost image; restoring a file to your hard drive is as easy as copying a file from one folder to another.

Norton Ghost 2002 is useful after major disasters or for migrating to new hardware, but it's too complex for everyday backups.

—Bruce Kratofil

EDITORS' RATING 5.0
RATED 1 TO 10

< PROS >
Convenient for disaster recovery or moving to a new computer

< CONS >
Too complex; inconvenient for everyday backups; doesn't work with USB CD writers

DIRECT PRICE: $69.95

< REQUIRES >
Windows 98, Me, NT Workstation 4.0, 2000, or XP

Symantec
800-441-7234
www.symantec.com

Shopper PriceIt!™ 35252
For real-time pricing, go to *shopper.com* and enter number.

ULEAD DVD MOVIEFACTORY

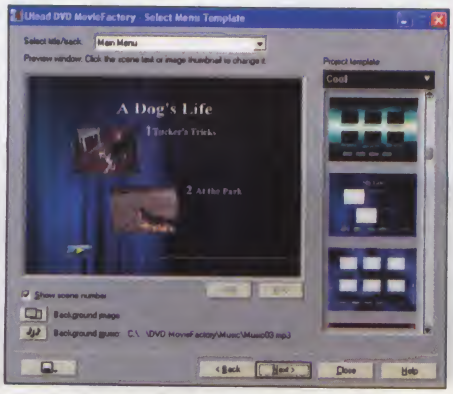
Homemade Movies, Just Short of Simple

HOME MOVIES HAVE COME A LONG WAY—TODAY, you can edit digital footage and save it on DVDs. The $49.95 Ulead DVD MovieFactory lets you create flashy, polished DVDs. We were impressed by its ability to create professional-looking menus, but less so by its ease of use.

MovieFactory's opening screen offers four main choices: capture video, author menus, burn disc images, and make CD labels and covers. The capture screen organizes the controls in the top left corner and displays preview images on the top right; video clips are arranged along the bottom.

From the capture screen, you can make simple cuts to your movie, but don't look for powerful editing features. Once you have all your clips, select Batch Convert from the controls at the top left to convert them to another video format, or select Make a Movie to string clips into one longer video file. The screen isn't elegant or easy to use, but it's better than MedioStream's competing NeoDVD.

Next, you can export your videos to a variety of formats, such as DVD, Video CD (VCD), Super Video CD (SVCD), or DV. MovieFactory walks you through the process of starting a new project, creating an onscreen menu of clips, and making submenus for each clip so viewers can jump to different scenes. When you're done, you can preview the finished product before you burn a disc. You can also output your creation in VCD or SVCD format, burning it onto a standard CD-R or CD-RW disc.



If you have digital-editing experience and are looking for fairly low-level tools, Ulead DVD MovieFactory is worthwhile and powerful. But it's too complicated for beginners—the controls on the editing screen can be hard to understand, and the brief manual doesn't provide enough help. No Mac version of MovieFactory is available, and it's more than twice as expensive as Apple Computer's $19.95 iDVD. For PC users, though, MovieFactory easily trumps NeoDVD in terms of features and ease of use.

—Troy Dreier

EDITORS' RATING 7.3
RATED 1 TO 10

< PROS >
Makes DVD creation fairly easy; excellent tools for creating menus; exports to a wide variety of formats

< CONS >
Editing tools hard to understand; no Mac version

DIRECT PRICE: $49.95 (boxed); $44.95 (download)

< REQUIRES >
Pentium III or faster recommended; 64MB RAM (128MB recommended); 70MB hard drive space required for installation, 4GB for video capture and editing; Windows 98, 2000, Me, or XP; writable CD or DVD drive

Ulead Systems
800-858-5323
www.ulead.com

Shopper PriceIt!™ 35251
For real-time pricing, go to *shopper.com* and enter number.

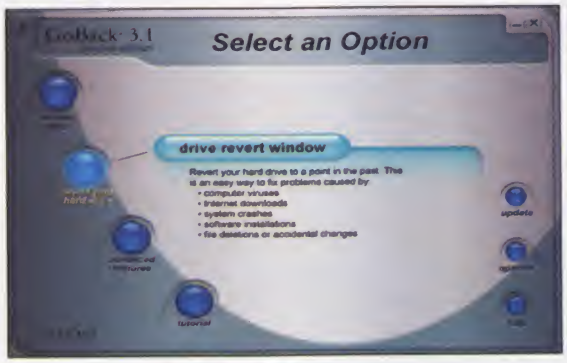
SOFTWARE

GOBACK 3 DELUXE

Take Your PC Back in Time

SO YOU'VE JUST FINISHED DOWNLOADING AND installing a dandy new utility, but it corrupted your copy of Internet Explorer. You might go half-mad trying to undo the damage unless you're running Roxio's GoBack 3 Deluxe, a nifty $49.99 utility that allows you to easily and reliably restore your system to a time when it worked properly. Windows Me and XP users can pass on this app, because a similar utility is built in. But if you run any other version of Windows, keep a copy of GoBack on hand.

GoBack works like a virtual drive. Once you've installed the software, it allocates about 10 percent of your hard drive to saving snapshots—virtual photographs—of your system's state at any given time. (You can allocate less space if you're in a storage crunch.) Roxio hides these snapshot files in the root directory of your C: drive; while you can elect to copy the snapshot file to another of the drive's partitions, it must reside on the physical drive.



After GoBack takes the initial snapshot of the system, the software creates new snapshots whenever it detects a change in a file, program, or your system's configuration. It works in the background with no noticeable performance degradation. If you hit a snag and have to revert to an earlier state—or even if you install some software, then later want to return to your preinstall state—just open the GoBack control panel by double-clicking the GoBack icon in the system tray. With the control panel open, click one of the clearly labeled buttons to select a snapshot, dial back the hard drive to an earlier point, or view details of all disk-related activity on the PC.

With GoBack, you no longer need to troubleshoot frustrating system problems—you just roll back the system to a point in the past when things were working properly. It's a powerful tool for anyone looking to simplify PC problem-solving.

—*Stephen Bigelow*

EDITORS' RATING 9.0
RATED 1 TO 10

< PROS >
Restores entire system to an earlier state

< CONS >
Windows Me and XP have a similar utility built in

DIRECT PRICE: $49.99 (boxed), $39.99 (download)

< REQUIRES >
Pentium or faster; 64MB RAM; 10 percent of hard drive space (variable); Windows 95, 98, Me, NT 4.0, 2000, or XP

Roxio
866-280-7694
www.roxio.com

Shopper Price It!™
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For real-time pricing, go to *shopper.com* and enter number.

WEB SERVICES

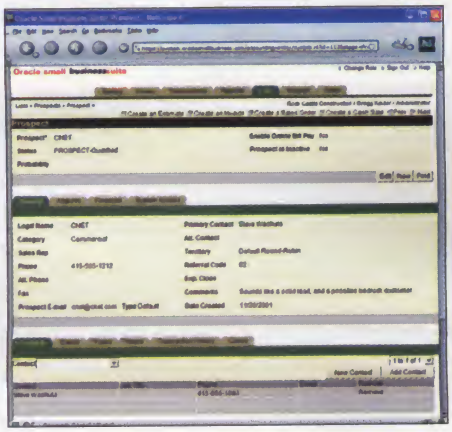
ORACLE SMALL BUSINESS SUITE 7.0

The Book on Online Accounting

ORACLE SMALL BUSINESS SUITE (OSBS) 7.0 MAY look like a mild-mannered balance sheet, but underneath, it's powerful, feature-rich, and can leap tall budgets in a single bound. This online suite blends accounting, sales, customer service, shipping, and Web-store management better than any other product, online or off. But at $99 per month, Oracle is a little pricey for its target market.

OSBS lives online, so you need only a browser to use it. And unlike its graphics-heavy competitors, it eschews fancy icons and wizards in favor of spartan onscreen forms and lists.

Like any accounting software, OSBS requires a prodigious amount of setup, configuration, and general up-front finessing. Plan to dedicate hours or even days to creating customer lists, building inventories, constructing payrolls, and the like. Fortunately, you can import customers and inventories from Quicken, QuickBooks, or Peachtree Accounting.



Even with high-speed Internet access, however, OSBS is slower than the slowest desktop accountant, and searches are especially pokey.

Nonetheless, there are three main reasons to buy into this online system: sales automation, customer service, and a Web store. For example, OSBS's Store module helps you build a Web storefront, stocks it with products from your inventory, and ties it to your accounting database. A sale on the Web automatically generates an invoice and deducts the sold items from inventory.

If you need tech support, you can reach it via e-mail 24/7, or through a toll-free call 12 hours each weekday. The online support is first-rate and contains documentation, getting-started guides, and tutorials.

OSBS has one serious drawback: It costs $99 per month, compared with a one-time charge of about $500 for competitors such as QuickBooks. At these prices, you should plan on taking advantage of every aspect of the program, from accounting and sales tracking to customer service and online selling. If you can't, lay down a one-time payment for a solid desktop accounting program instead.

—*Gregg Keizer*

EDITORS' RATING 7.4
RATED 1 TO 10

< PROS >
No software to install; includes sales tools; integrates tightly with a Web store

< CONS >
Monthly fee too high for some small businesses; slow; overwhelming array of options

PRICE: $99 per month for two users; $50 per month for additional users

< REQUIRES >
Microsoft Internet Explorer 4.1 or later, Netscape Navigator 4.1 or later

Oracle
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- Embedded Gigabit NIC
- 1-Yr Next Business Day On-Site Service,[3] 1-Yr Limited Parts Warranty,[2] 1-Yr 24x7 Dedicated Server Phone Tech Support

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WEB SERVICES

Digital Music For the Masses

These for-pay music services pipe out tunes galore, but with a cacophony of limitations.

NAPSTER MAY BE RESTING, BUT MAJOR MUSIC labels are scrambling to come up with a money-making system that lets people stream and download music from their favorite artists. While we applaud their efforts, the early results from Pressplay and MusicNet's RealOne Music are a hair shy of compelling.

PRESSPLAY

EDITORS' RATING 6.2

PROS: Create compilation CDs from downloaded songs; songs don't expire at the end of the month
CONS: Frustrating search function; allows only two songs by the same artist on a compilation disc

Pressplay *(www.pressplay.com)* is available from MSN, Yahoo, Roxio, and MP3.com. You have to download the player from one of these affiliates, but the player and the content—from Sony Music, Universal, and EMI, as well as independent labels—are the same, whichever you choose. Once you've selected a payment plan, you'll get an e-mail with a link to download and install the player.

We created a list of 14 popular artists to compare Pressplay's music content to RealOne Music's. RealOne had music by six of the artists, and Pressplay had seven. Although Pressplay's catalog has a good variety of popular artists, it rarely has all the tracks of a given CD, or the newest songs. Plus, Pressplay's search function is awkward, and you can't browse all the artists from A to Z.

You can stream songs through Pressplay, but there's no option for CD-quality streams, only 20kbps or 32kbps. If you know you'd like to listen to a particular song often, download it to your computer so that you won't waste your allowance of streams. Songs are downloaded in the WMA format, played at 128kbps, and can be stored on two computers. Downloads become inaccessible if you cancel the Pressplay service, however. Pressplay also allows you to burn CDs, but only a certain number of tracks per month, and then no more than two on a disc from the same artist.

After a free 14-day trial, Pressplay's basic plan costs $9.95 a month for 300 streams and 30 downloads. For $14.95, the Silver plan allows 500 streams, 50 downloads, and the opportunity to burn 10 CD tracks. Gold and Platinum plans are also available.

While Pressplay may be a hit with those who enjoy surveying new music, we found its offerings too limited to justify the price.

—Troy Dreier

Pressplay

RealOne Music

REALONE MUSIC

EDITORS' RATING 7.1

PROS: Integrated into the RealOne Player; inexpensive way to find new music
CONS: Can't burn songs to CDs or transfer them to a portable player

RealOne Music *(www.real.com)* is powered by MusicNet and derives content from BMG, EMI, Warner, and Zomba. It works through RealOne Player, itself a hybrid video player, jukebox, online radio tuner, disc burner, and Web browser.

Like Pressplay, RealOne Music rarely offered all the songs on any given album, and again, new content was sometimes hard to come by. As of this writing, for example, RealOne Music had 80 songs by Tom Waits, but all from older records.

RealOne Music members can listen to streaming content at up to 64kbps. Although you can create playlists from your library, you can't share your playlists like you can with Pressplay. Also, RealOne Music downloads expire after 30 days. You can prevent your favorite songs from expiring by right-clicking on them in the Library and selecting Keep Active. Doing so will automatically use one of your download credits each month for each song.

The biggest snag is that you can only listen to your songs at your PC. Songs are downloaded in the RealMedia format and are protected from copying to portable music players or CDs.

If you're interested in RealOne Music alone, a $9.95-per-month membership option offers 100 streams and 100 downloads, plus access to RealOne's network of 48 commercial-free radio stations. A $19.95 RealOne Gold membership gives you access to all of RealNetworks' premium content, including news and television streams, in addition to 125 music streams and 125 downloads a month.

While it's hard to imagine paying $10 a month for music that can't be carried around and that expires every month, RealOne Music may be a good choice for those who crave variety. It's useful if you want to discover new bands, but only if you do all your listening at your PC.

Although we prefer RealOne Music to Pressplay, neither service comes close to what is already available free, albeit illegally, online.

—T.D.

< PRODUCT SUMMARY >

EDITORS' RATING (Rated 1 to 10)	6.2	7.1
SERVICE	Pressplay	RealOne Music
COMPANY	Pressplay 888-660-2265 *www.pressplay.com*	MusicNet 888-768-3248 *www.real.com*
PRICE	Free for 14 days; $9.95 per month thereafter (basic plan); additional pricing plans available	$9.95 per month (basic plan); $19.95 (Gold plan)

GAMESPOT

RALLY TROPHY

Get Back on Track

Unlike most PC racing games, Rally Trophy imitates the art of European rallying—essentially a series of timed trials in which drivers must individually negotiate long and sometimes outrageously twisty stretches of back road. The game deviates from real-world rallying in that it always positions you as the final entrant in contests with insanely fast competitors. Yet it is very realistic in most other respects.

Rally Trophy's 11 wonderfully detailed, vintage vehicles never shed parts or morph into tangled hunks of wreckage, but they do suffer a variety of bent bumpers, buckled hoods, cracked windshields, and various mechanical failures. Developer Bugbear Entertainment has obviously worked hard to re-create an astonishingly distinct physics model for each automobile.

Graphically, the game is often stunning. Bugbear did a good job camouflaging its 2D trees and vegetation, though it did an unremarkable job depicting the various forms of wildlife that gallop across the road in front of you. The game's most impressive visual element is its assortment of sun flares and effects, the most complex and dynamic ever seen in a racing game.

It lacks many of the perks found in other racing titles, such as saved replays and polished menu systems, but Rally Trophy clearly comes from the heart. Imagine Papyrus Racing Games' classic Grand Prix Legends on dirt, and you get the picture: one of the great, pure driving games of the new millennium.

EDITORS' RATING 8.7
JoWood Productions Software; $29.99
www.rallytrophy.com

—Gord Goble

IL-2 STURMOVIK

The Sky's the Limit

Ubi Soft Entertainment's IL-2 Sturmovik has all the immersion, playability, and graphical splendor that enriched classics such as Red Baron, Aces Over the Pacific, Falcon 3.0, and European Air War.

It's also arguably the most beautiful flight sim to date. The World War II aircraft models are superbly detailed, from chipped paint to moving control surfaces, down to every flap and slat. The volumetric clouds, the atmospheric lighting, and the weather effects, meanwhile, are the stuff of tech demos.

The graphics really take off when the shooting starts. IL-2 has a realistic tracer effect with occasional illuminated rounds for machine guns. Larger-caliber cannons and rockets leave sharp smoke trails, while dogfights at higher altitudes leave twisting coils of contrails. Variable zoom levels let you effectively stick your head up to the sights and fire at your target as if you were shooting footage with a gun camera.

IL-2 sounds as good as it looks, with distinctive engine sounds, hearty gunfire, and authentic-sounding radio transmissions in German and Russian. The flight models are also superlative. From Russia's lumbering IL-2 bombers to Germany's nimble Bf-109s, each plane has its own style and character without any canned or scripted responses. The manual boasts 31 flyable aircraft, but most are variants of about a dozen different aircraft.

EDITORS' RATING 9.2
Ubi Soft Entertainment
$39.99
www.ubisoft.com

Flight sims may be one of gaming's most-established genres, but titles such as this keep it reaching incredible new heights.

—Tom Chick

SECRET SERVICE: IN HARM'S WAY

A Shot in the Dark

Secret Service: In Harm's Way, Activision Value Publishing's new value-price tactical shooter, has one terrific effect: Instead of the usual canned-death animations, characters die in context to their surroundings. Shoot a guy standing in front of a building, and he may fall back, hit the wall, and slump forward—all in real time. It's a great addition, and one that more games could use. Unfortunately, it only works about half the time.

Secret Service also has one of the most difficult first levels ever seen in a shooter. Forget about training or any attempts to ease you into things—level one drops you in the middle of an intense firefight. Assuming you make it past the first level, the following 15 offer the same mix of excitement, confusion, and frustration in various proportions. The later levels are insanely hard, moderately tough, or incredibly easy, but not in any particular pattern.

The game has four multiplayer modes: deathmatch, team deathmatch, capture the flag, and survivor. But the lack of an in-game server browser or support for a third-party player-matching service such as GameSpy means you may never get a chance to try the multiplayer game.

Secret Service: In Harm's Way can be thrilling at times in spite of itself. But with a $29.99 price, the game doesn't quite cut it as either a budget title or a full-featured shooter.

EDITORS' RATING 6.7
Activision Value Publishing
$29.99
www.activisionvalue.com

—Erik Wolpaw

SCHIZM: MYSTERIOUS JOURNEY

Across the Great Divide

Schizm: Mysterious Journey is like a flashback to five years ago, when every adventure game was modeled on Myst and situated on a desolate world filled with strange technology. But even then, Schizm would have been more akin to Sierra's Rama or Rocket Science's Obsidian: definitely inspired by Myst, but with more-complex puzzles.

Schizm takes place on a seemingly abandoned planet, where an exploration team has mysteriously disappeared. You control two characters, Sam and Hannah, who have been sent to find out what happened to both the researchers and the planet's former inhabitants. Throughout the game, you'll switch between the two to solve strange riddles, contraptions, and puzzles.

The puzzles are difficult but enjoyable. For example, you'll have to decode cryptic diagrams and learn to work complex machines with all the significant symbols in an alien language. Most puzzles require you to find the key that decodes a specific gadget and then get the gadget working. Once you figure out a few, you'll know what you generally need to do for the others.

Unlike most adventure games, however, Schizm's puzzles make sense—after a good deal of brainwork. Most are nothing but a series of locked-door puzzles, but they are well thought-out, original, and interesting. Gamers looking for a challenge will find it here.

EDITORS' RATING 7.8
DreamCatcher Interactive
$29.99
www.schizm.com

—Ron Dulin

For more game reviews, go to *gamespot.com*.

ATHLON XP vs. PENTIUM 4

Clash of

BY RICK BROIDA, RICH BROWN, LORI GRUNIN, AND BILL O'BRIEN

INTRODUCTION BY STEVE SCHWARTZ

Buying a PC was never really simple, but recent CPU offerings from AMD and Intel make the choice more complicated than ever. In addition to the expected increases in clock speed, the latest processors from both companies incorporate new features that advance the essence of computing itself.

AMD's Athlon XP lineup, for example, seeks to replace familiar clock-speed ratings with a new, performance-oriented rating system, while delivering several noteworthy improvements over previous Athlon designs. (See the sidebar "What Makes the Athlon XP Xtra Special?") AMD also receives an assist from nVidia's new nForce 420D chipset, which complements the CPU with a new approach to motherboard architecture. (See the

AMD unleashes a totally overhauled Athlon. Intel shaves the 2.2GHz Pentium 4 down to 0.13 micron. Suddenly, it's serious.

the CPUs

sidebar "Burning Bridges" for a description.)

But perhaps the most significant advance is Intel's new 0.13-micron manufacturing process, code-named Northwood, which debuted with the 2.2GHz Pentium 4 processor. Compared with earlier, 0.18-micron CPUs, the 2.2GHz CPU's smaller die size effectively speeds up processing functions by shrinking the physical distance data needs to travel. The new processor also features a 512K cache, double the size of its predecessor.

We looked at three Athlon systems, one each based on the XP 1800+, 1900+, and 2000+ CPU, plus two systems based on the 2.2GHz Pentium 4, one with RDRAM, one with DDR SDRAM. As a group, these five desktops are an accurate sampling of the current state of the art in personal computing. Suffice it to say, although some of these PCs are quantitatively faster than others, there's not a slowpoke in the bunch.

ATHLON XP vs. PENTIUM 4

< FACT FILE >

Category Tested	Athlon XP versus Pentium 4
Price Range	$1,474 to $2,999
Minimum Configuration	256MB RAM; 1.53GHz CPU; 40GB hard drive; 64MB graphics memory; DVD-ROM drive; 16x/10x/40x CD-RW drive; stereo speakers; 15-inch LCD or 19-inch CRT monitor; Windows XP Home Edition
Companies Included	ABS Computer Technologies, Atlas Micro Logistic, Gateway, MicronPC, Polywell Computers

ABS CHEETAH

EDITORS' RATING 6.9

PROS: Outstanding sound card; well-organized manuals, system software; large software bundle
CONS: Substandard speakers; no front-mounted USB ports; test system arrived with incorrect DVD setup

The ABS Cheetah has a zippy processor, fast graphics, and a terrific sound card with an incredible assortment of input/output connections, including IEEE 1394 (FireWire) ports. It's also a solid buy for $1,969 direct. But some users may be put off by the system's lackluster speakers and a few relatively small design flaws.

In terms of hardware, the Cheetah definitely delivers. A 1.6GHz Athlon XP 1900+ CPU, a GeForce3 Ti 500 graphics card with DVI and S-Video outputs, a 60GB hard drive, and 512MB of DDR SDRAM form the core of the system. For multimedia creation and consumption, a 16x DVD-ROM drive, a 24x/10x/40x CD-RW drive, the sharp 19-inch Hitachi CM715 monitor, and the feature-packed Creative Labs Sound Blaster Audigy Platinum card with its front-accessible I/O bay round out the package.

Still, despite its name, the Cheetah is not the fastest kitty on the block. In fact, it was near the back of this pack, consistently holding fourth place on most of our benchmark tests. The one notable exception was 3DMark2001 Pro, in which the Cheetah grabbed the middle spot.

But the real disappointment was the system's Altec Lansing 641 five-piece speaker system, which lacks the tonality and fidelity of other speaker systems in this group. Your only upgrade option is the excellent but much costlier Klipsch ProMedia 5.1 system, a $230 markup. We've also gotten accustomed to seeing more than two USB ports on systems of this caliber, preferably with two on the front of the case. The Cheetah has only two, both around back.

In addition, our test system arrived with one configuration glitch: The CyberLink PowerDVD software was not properly associated with the DVD drive. Although the problem was easily remedied, little touches like these separate the kittens from the big cats.

ABS neatly packs all of the component manuals, drivers, and software CDs in a well-organized three-ring binder, and backs the Cheetah with a three-year parts-and-labor warranty, which you can upgrade with an onsite-service option ($29 for one year, $129 for three). Phone tech support is available only during business hours.

ABS Cheetah

Unless you're an audio diehard, there's no need to fear the ABS Cheetah. It's a powerful, flexible, and reasonably priced desktop that should serve you well.

ATLAS MICRO XELERATOR XP7700

EDITORS' RATING 7.4

PROS: Affordable price; terrific sound card, speakers
CONS: Poorly written manual; messy, cramped interior; sparse software bundle

Atlas Micro's Xelerator XP7700 embodies the prototypical differences between large and small PC vendors. With its combination of plastic and shiny metal, the front bezel lacks aesthetic consistency. The manual is poorly organized and plagued by content gaps and poor grammar. And inside the case, cables are not routed well, and the graphics card obstructs access to the hard drive. Still, those willing to overlook such oversights will get a $1,474 PC with performance comparable to systems

< FEATURE COMPARISON >

	ABS Cheetah	Atlas Micro Xelerator XP7700
DIRECT PRICE	**$1,969**	**$1,474**
CONFIGURATION		
Processor	1.6GHz AMD Athlon XP 1900+	1.53GHz AMD Athlon XP 1800+
System Memory Installed/Maximum	512MB DDR/1.5GB	256MB DDR/1GB
Motherboard Manufacturer	Gigabyte	Shuttle
Motherboard Chipset	Via VT8233	Via VT8233
Hard Drive (Spin Rate)	60GB IBM (7,200rpm)	40GB Western Digital (7,200rpm)
Graphics Card	64MB nVidia GeForce3 Ti 500	64MB nVidia GeForce3 Ti 200
Monitor	19-inch Hitachi CM715 CRT	19-inch ViewSonic E95 CRT
CD-RW Drive	24x/10x/40x Plextor PlexWriter	16x/10x/40x Plextor PlexWriter
DVD-RAM Drive	None	None
DVD-ROM Drive	16x Toshiba SD-M1612	16x Toshiba SD-M1502
Sound Card	Creative Labs Sound Blaster Audigy Platinum	Creative Labs Sound Blaster Audigy
Speaker System	Altec Lansing 641	Creative Inspire 5.1 5300
Number of Speakers	Five	Six
CONNECTIVITY/EXPANSION		
Ports	Parallel, two serial, game, DVI-D, two USB, two IEEE 1394	Parallel, two serial, two game, DVI-D, four USB, IEEE 1394
Available Front-Accessible 3.5-Inch Bays	One	One
Available Front-Accessible 5.25-Inch Bays	None	Two
Available Internal 3.5-Inch Bays	One	Two
Available Internal 5.25-Inch Bays	None	Two
PCI Slots (Total/Available)	Five/two	Six/four
AGP Slot	Yes	Yes
SOFTWARE		
Installed OS (as Tested)	Windows XP Home Edition	Windows XP Home Edition
Bundled Software	Easy CD Creator 5, WinFast DVD, Adobe Acrobat Reader 5.0, Corel WordPerfect Office 2002, Deus Ex, Ulead VideoStudio Basic SE, Cubasis VST CE, Gunlok, CyberLink PowerDVD	CyberLink PowerDVD, Easy CD Creator 5
SERVICE AND SUPPORT		
Warranty Length	Three years parts and labor	Three years parts and labor
Onsite-Service Term	Optional: $29 (one year); $129 (three years)***	Optional: $39 (one year)
Toll-Free Technical Support	Yes	Yes
Technical-Support Hours (ET)	11:30 a.m. to 8:30 p.m. M-F	11:30 a.m. to 8:30 p.m. M-F

* = Read speeds: 2x (4.7GB DVD-RAM), 1x (2.6GB DVD-RAM), 6x (DVD-ROM), 24x (CD-ROM/CD-R), 12x (CD-RW)

costing upwards of $750 more.

Based on a 1.53GHz Athlon XP 1800+ CPU and 256MB of DDR SDRAM, the Xelerator offers a respectable, and occasionally cutting-edge, selection of components. Along with the de rigueur 64MB GeForce3 Ti 200 graphics card, 16x DVD-ROM drive,

Atlas Micro Xelerator XP7700

and 40GB 7,200rpm hard drive come a few surprises. These include ViewSonic's solid E95 19-inch CRT, a Plextor 16x/10x/40x CD-RW drive, a Sound Blaster Audigy sound card, and the amazing Creative Inspire 5.1 5300 speaker system—all first-class components. Factor in four USB ports

ATHLON XP vs. PENTIUM 4

(two in the front) and the IEEE 1394 jack on the Audigy card, and the price suddenly seems like it should be a lot higher.

Although the Xelerator's benchmark scores were the group's lowest overall, the system clearly held its own. In fact, on most tests, it easily topped two 2GHz Pentium 4-based systems we recently looked at—the Dell Dimension 8200 and Micron Millennia Max XS, which, at press time, cost between $650 and $750 more.

Still, the Xelerator does demand some compromises. The PC is backed by a generous three-year parts-and-labor warranty, but you'll have to ship the unit back to Atlas in City of Industry, Calif., at your own expense, for repairs. (We'd recommend going with one of the optional onsite packages, starting at $39 for one year.) Atlas provides toll-free phone tech support for the life of the system, but only during business hours.

Moreover, we were disappointed by the support section on the Atlas Web site, which contains only the troubleshooting guide from the user's manual and a half-finished driver-download section. Last, the system comes with very little software—CyberLink's PowerDVD and Roxio's Easy CD Creator 5—an understandable cost-cutting measure.

All considered, the Atlas Micro Xelerator XP7700 wouldn't be ideal for a computing newbie, but tech-savvy users might be willing to forgive the system's inconveniences in exchange for its unbeatable price.

	Gateway 700XL	MicronPC Millennia TS Professional	Polywell Poly 880NF-2000
	$2,999	$2,199	$2,250
	2.2GHz Intel Pentium 4	2.2GHz Intel Pentium 4	1.67GHz AMD Athlon XP 2000+
	512MB RDRAM/3GB	256MB DDR/1GB	512MB DDR/1.5GB
	Intel	Intel	Microstar International
	Intel D850	Intel 845	nVidia nForce 420D
	120GB Western Digital (7,200rpm)	80GB Western Digital (7,200rpm)	Two 40GB Maxtor (7,200rpm)**
	64MB ATI Radeon 8500	64MB nVidia GeForce3 Ti 200	64MB nVidia GeForce3 Ti 500
	15-inch Gateway FPD1520 LCD	19-inch MicronPC 910EX CRT	19-inch ViewSonic GS790 CRT
	24x/10x/40x Lite-On LTR-24102B	16x/10x/40x NEC NR-7800A	16x/10x/40x BTC BCE 1610
	Panasonic LF-D311*	None	None
	None	16x NEC DV-5800A	16x Sony DDU1621
	Creative Labs Sound Blaster Live Value	Creative Labs Sound Blaster Live Value	Integrated
	Boston Acoustics BA7800	Altec Lansing AVS300W	Cambridge SoundWorks SW320
	Five	Three	Three
	Parallel, two serial, game, DVI-D, six USB, IEEE 1394	Parallel, serial, game, six USB, two IEEE 1394	Parallel, serial, game, DVI-D, four USB
	One	Two	Two
	None	None	Two
	Two	None	Two
	None	One	None
	Five/two	Six/three	Five/three
	Yes	Yes	Yes
	Windows XP Home Edition	Windows XP Professional	Windows XP Home Edition
	Microsoft Office XP Small Business, VideoWave 5	Microsoft Office XP Small Business, Nero Burning ROM, ROM, WinDVD, Pinnacle Studio 7 SE	Norton AntiVirus 2000, NTI CD-Maker Plus, CyberLink PowerDVD, Cheyenne BitWare
	One year parts and labor	One year parts and labor	One year parts, five years labor
	One year	One year	Optional
	Yes	Yes	No
	24 hours daily	24 hours daily	24 hours daily first year, 11 a.m. to 9 p.m. M-F afterwards

** = Two drives configured in a RAID 0 array *** = Includes 24/7 technical support

GATEWAY 700XL

EDITORS' RATING 8.0

PROS: Fastest performer; LCD monitor; DVD-RAM drive; immense 120GB hard drive
CONS: One-year warranty; expensive; LCD is analog, not digital

Gateway cranks it up to 11 with the 700XL, one of the first systems to market using Intel's powerful 0.13-micron 2.2GHz Pentium 4 processor. But hitting new heights also means paying higher prices, and few budgets can comfortably accommodate this system's $2,999-direct price.

Still, if you're looking for the absolute fastest system out there—at least according to the numbers—the 700XL is the one to get. Interestingly, this RDRAM-based system was only a scant 3 to 7 percent faster than the DDR SDRAM-based MicronPC Millennia TS Professional on our productivity-application tests, although its graphics-performance scores were significantly higher.

The 700XL also pulls ahead of the group in terms of data storage with its near-bottomless 120GB hard drive. The drive is perfect for dabbling in video editing, as is the front-mounted IEEE 1394 port—not to mention the six USB ports, two of which are front-mounted. And did we mention the Panasonic LF-D311 DVD-RAM drive? It can burn up to 9.7GB on a DVD-RAM disc or 4.7GB on a DVD-R. MGI's VideoWave 5 is included to help you polish your digital-video gems. The 700XL also comes bundled with Microsoft Office XP Small Business and one free year of AOL.

Although the 700XL's ATI Radeon 8500 card has both VGA and DVI ports, the 15-inch Gateway FPD1520 LCD monitor is analog-only. We placed it alongside an upscale IBM T560 15-inch analog/digital display running in analog mode; except for the FPD1520's comparatively huge bezel, the displays didn't look notably different.

Gateway is also slightly behind the curve with its choice of an older Sound Blaster Live Value card. But the board goes nicely with the Boston Acoustics BA7800

ATHLON XP vs. PENTIUM 4

What Makes the Athlon XP Xtra Special?

It may look a lot like its namesake, the Athlon CPU formerly known as Thunderbird, but beneath its exterior, the Athlon XP boasts a new architecture that makes it more competitive with the Pentium 4 in three key respects.

Perhaps the most useful new addition is the improved data prefetch, in which the CPU observes your system's memory-access patterns and fetches data it thinks you'll want before it's actually requested—literally allowing your PC to be ready when you are. The Athlon XP's prefetch also makes better use of high-bandwidth memory, so DDR SDRAM is far more beneficial to the Athlon XP than it was to other Athlons.

The second improvement is an increased number of translation look-aside buffer (TLB) entries in the Level 1 cache. A TLB is basically a table that matches virtual-memory addresses to physical-memory addresses. The more entries a TLB has, the greater the likelihood the CPU will find the addresses it needs and avoid data conflicts.

The CPU also includes 52 new processor instructions, which AMD has dubbed 3DNow Professional. These instructions are actually the same SSE instructions that debuted in the Pentium III and are still used by the Pentium 4; they allow the processor to apply a single instruction to multiple data sets for improved multimedia performance. The Athlon XP's inclusion of SSE lets it compete on a more equal footing with Intel processors in certain media-encoding applications—although the presumed benefits are not yet reflected in the chips' scores on BAPCo's Internet Content Creation and SYSmark 2001 benchmark tests.

—Eric Franklin

Gateway 700XL

five-piece speaker system, which performs quite well with both game and DVD movie soundtracks.

Except for the motherboard, the 700XL's midtower chassis is tool-free and provides three vacant 3.5-inch bays (one front-accessible) and two PCI slots to fill if needed. Toll-free technical support is available around the clock, and though we feel Gateway is being a bit stingy with its one-year warranty (which includes onsite service), you can bump up the coverage to three years for another $119.

If you think about your checking account when you look at the Gateway 700XL, it's probably not the system for you, but users who demand uncompromising computing excellence won't be disappointed.

MICRONPC MILLENNIA TS PROFESSIONAL

EDITORS' RATING 7.8

PROS: Low price for top-shelf performance; useful software bundle; easy-access case
CONS: One-year warranty; phone support expires after one year; midrange speaker system

It's not the first system to cruise past the 2GHz mark, but MicronPC's Millennia TS Professional is the first we've seen to pair the new 2.2GHz Pentium 4 with DDR SDRAM rather than RDRAM. The result is a $2,199-direct system that costs less than similarly configured RDRAM models, but with no appreciable loss in performance.

As such, the Millennia makes another powerful argument for Intel's new manufacturing process. The system's SYSmark 2001 scores trailed a mere 5 percent behind the Gateway 700XL, which came stocked with 512MB of RDRAM compared with the Millennia's 256MB of DDR SDRAM. And while we have not seen significant differences in *benchmark* performance between 256MB and 512MB of RAM, the Millennia results indicate that the DDR memory did not constrain the CPU as much as RDRAM proponents would have you believe.

The Millennia comes stocked with all the expected luxuries: a large 80GB hard drive, a 16x DVD drive, a CD burner, and MicronPC's behemoth 910EX 19-inch CRT, which commands a significant chunk of desk space but produces crisp text and vibrant images all the way up to a 1,280-by-1,024 resolution. We do feel, however, that MicronPC skimped a bit with the Altec Lansing AVS300W speakers, a low-price three-piece set. On the other hand, the system had one of the group's more eclectic software bundles, including Microsoft Office XP Small Business; Pinnacle Studio 7 SE, a robust video-capture and -editing application; and Ahead Software's Nero Burning ROM for CD-burning chores.

MicronPC's tool-free tower case also

(continued on page 102)

< COMPUTER SHOPPER BENCHMARKS >

	ABS Cheetah	Atlas Micro Xelerator XP7700	Gateway 700XL	MicronPC Millennia TS Professional	Polywell Poly 880NF-2000
PROCESSOR	**1.6GHz AMD Athlon XP 1900+**	**1.53GHz AMD Athlon XP 1800+**	**2.2GHz Intel Pentium 4**	**2.2GHz Intel Pentium 4**	**1.67GHz AMD Athlon XP 2000+**
SYSTEM MEMORY	512MB DDR SDRAM	256MB DDR SDRAM	512MB RDRAM	256MB DDR SDRAM	512MB DDR SDRAM
APPLICATION PERFORMANCE					
BAPCo SYSmark 2001	178	174	219	208	195
Internet Content Creation*	177	172	246	230	194
Office Productivity	179	176	195	189	196
3D-GRAPHICS PERFORMANCE					
MadOnion.com's 3DMark2001 Pro (16-Bit Color)	7,591	6,889	8,781	6,707	8,309
MadOnion.com's 3DMark2001 Pro (32-Bit Color)	7,509	6,827	8,378	6,593	8,150
REAL-WORLD 3D-GAME TESTING					
Quake III Arena (Frames per Second)	167.7	153.2	193.8	153.8	177.8
MPEG-2 ENCODING PERFORMANCE					
MadOnion.com's Video2000 (Frames per Second)	44.2	42.6	49.3	46.4	49.3

* = This benchmark has not been updated to test for SSE support in Athlon XP CPUs. We expect actual performance may be as much as 15 percent higher than the result noted, and the overall BAPCo SYSmark 2001 score may be up to 7 percent higher.

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(continued from page 98)

brims with expansion options. At the rear, you'll find four USB and a pair of IEEE 1394 ports. (Regrettably, the latter are on a PCI card.) Two more USB ports adorn the front of the case, but they're sunk into a deep recess and can be awkward to access.

A bigger complaint is the Millennia's brief one-year warranty. Although a year of onsite service is included, MicronPC's 24/7 toll-free phone technical support expires at the end of the warranty period. You can, however, extend the parts coverage to three years for $100, or get three years of both parts-shipping and onsite service for $199.

MicronPC Millennia TS Professional

The MicronPC Millennia TS Professional lets eager early adopters of the new Pentium 4 save a few hundred bucks without much sacrifice. But buyers should look carefully at the support policies to make sure all their needs are covered.

ATHLON XP vs. PENTIUM 4

POLYWELL POLY 880NF-2000

EDITORS' RATING 7.1

PROS: Fast application, graphics performance; cutting-edge motherboard
CONS: Expensive; no IEEE 1394 ports; mediocre speakers

For $2,250, you can't help but feel that you deserve more than the Polywell Poly 880NF-2000 delivers. Granted, the system has the fastest AMD processor available, a whopping 512MB of DDR SDRAM, two 40GB hard drives arranged in a RAID 0 array off a fast Ultra ATA/133 controller, and the new nVidia nForce 420D chipset on its motherboard. But everything else about the system is lackluster.

Unlike most PCs in its class, the 880NF-2000 doesn't rely on a sound card; rather, it takes advantage of the nForce's capable onboard audio. A Communication and Networking Riser (CNR) card provides an S/PDIF port for pure digital audio file transfers and full support for 5.1 audio. Still, it's all overkill for the Cambridge SoundWorks SW320, a merely adequate three-piece speaker system Polywell offers as the base configuration of this series. (We'd recommend opting for the Creative Inspire 5.1 5300 setup for an extra $60.) Upgrading to a dedicated sound card, such as Creative Labs' Audigy, meanwhile, could buy you an IEEE 1394 port, which the 880NF-2000 otherwise lacks.

Our test unit shipped with the ViewSonic GS790, a good all-purpose 19-inch CRT monitor, as well as run-of-the-mill CD-RW and DVD-ROM drives. The system also offers plenty of expansion, with four available front-accessible drive bays, plus two more inside. Three memory slots support any combination of DDR SDRAM modules (two 256MB modules were installed in our system), up to a maximum of 1.5GB.

Polywell Poly 880NF-2000

The Poly 880NF-2000 proved to be tough competition for Pentium 4-based systems on our benchmark tests. It was faster overall than the 2GHz Dell Dimension 8200 we looked at recently and effectively tied the Gateway 700XL on SYSmark 2001's Office Productivity test, although the 700XL was still significantly faster overall. It also posted the group's second-fastest 3DMark2001 Pro scores.

Useful utilities like Norton AntiVirus and CyberLink's PowerDVD are the biggest news in the minimal software bundle. By the same token, the one-year parts/five-year labor warranty is unremarkable, as is the cursory online support. Technophobes needing lots of hand-holding need not apply.

The limited software and support, combined with the middling speaker system, make the Polywell Poly 880NF-2000 seem overpriced. If you're savvy enough to configure the PC to meet your needs, however, it may be worth the extra money.

HOW FAST CAN YOU GO?

Clearly, we live in a time when computing speed is relative. But should you require the fastest computer that (lots of) money can buy, the 2.2GHz Pentium 4-based Gateway 700XL is your only choice, even though we still have some qualms about a one-year warranty for a system that costs nearly $3,000. But frankly, we wouldn't pass on any of these decked-out beauties. ▼

Burning Bridges

Typically, in most computer chipsets, a northbridge chip controls system-memory chores, the PCI bus, AGP functions, and Level 2 cache; and a southbridge chip addresses peripheral interfaces such as USB. The nForce 420D, the first in nVidia's nForce family of motherboard chipsets, replaces these chips with two new ones: an Integrated Graphics Processor (IGP), and a Media and Communications Processor (MCP), respectively.

The IGP's TwinBank memory architecture doubles the width of the memory bus to 128 bits, uses AMD's 800MHz HyperTransport bus to accelerate PCI throughput, and has a new cache architecture, which, in theory, increases the number of cache hits—and, in turn, CPU performance. The MCP's onboard audio-processing unit delivers 64-voice, Dolby 5.1-decoded sound and an isochronous (timing-sensitive) data-transport controller for improved multimedia performance.

The nForce 420D's built-in GeForce2-level graphics capability was intended to compete with the integrated graphics acceleration already offered in chipsets for low-cost PCs by Intel and other companies. But because the nForce is still appreciably more expensive, it's more likely to be found in systems with dedicated graphics cards.

—Lori Grunin

< PRODUCT SUMMARY >

EDITORS' RATING (Rated 1 to 10)	6.9	7.4	8.0	7.8	7.1
SYSTEM	ABS Cheetah	Atlas Micro Xelerator XP7700	Gateway 700XL	MicronPC Millennia TS Professional	Polywell Poly 880NF-2000
COMPANY	ABS Computer Technologies 800-876-8088 www.abspc.com	Atlas Micro Logistic 800-336-6898 www.buy-atlas.com	Gateway 800-846-4208 www.gateway.com	MicronPC 888-224-4247 www.micronpc.com	Polywell Computers 800-999-1278 www.polywell.com
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- Altec Lansing® AVS500 5 Piece Speaker System
- U.S. Robotics® V.90 56K Voice/Data/Fax Modem
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- Integrated AC97 3D Audio
- 7 Watt powered Speakers
- 56K V.90 Voice/Data/Fax Modem
- Medium Tower chassis with 300 watt
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- 7 Watt powered Speakers
- 56K V.90 Voice/Data/Fax Modem
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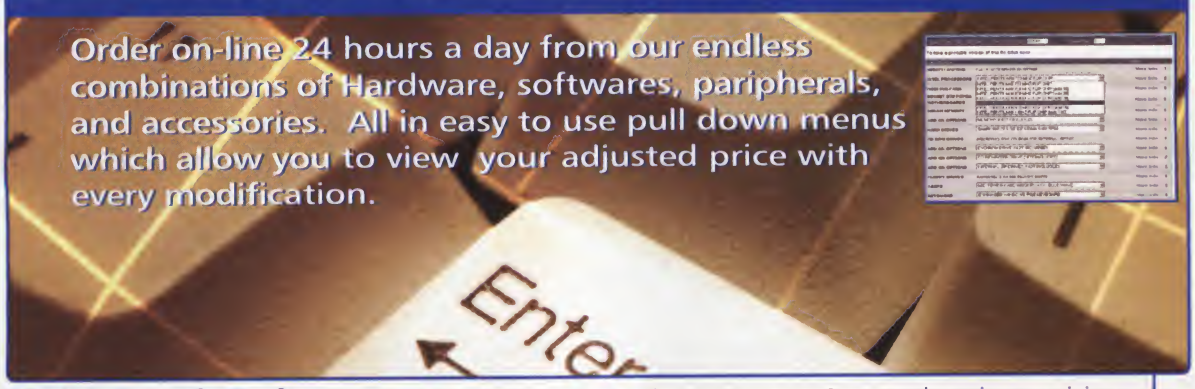

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GAMING CONSOLES

Top of Your Game

Xbox, GameCube, and PlayStation 2 go to the mat in a contest of the consoles.

BY DARREN GLADSTONE

The three primary gaming consoles are duking it out, each bringing its own brand of punch to the ring. The console contenders—Microsoft Xbox, Nintendo GameCube, and Sony PlayStation 2—all sport knockout features. Perhaps the most appealing is that they're *finally* widely available.

It wasn't always so. The PlayStation 2 (PS2) was big on promise when it was released more than a year ago, but it was short on titles, and units themselves were hard to come by. This past holiday season saw the PS2 come of age with widespread availability and lots of quality games. When you consider that it doubles as a DVD player right out the box, and factor in the impending arrival of an optional hard drive and Internet-connection peripherals, you're looking at one very appealing system.

This past holiday season also marked the debut of the GameCube and the Xbox. With years of gaming expertise under its belt, Nintendo is betting that a cheaper, dedicated gaming machine with great graphics can win out against multifunctional systems from Sony and Microsoft. In contrast, the Xbox distinguishes itself with built-in support for high-speed networking, an 8GB hard drive, DVD-playback capabilities, and display support for HDTVs. This box does much more than play games.

Before you buy, you'll need to decide which package packs the kind of kick you need. First, determine your priorities, weighing options such as online-gaming capabilities, popular or favorite titles, great graphics, a superb audio/video experience, form factor, and price. Then it should be easy enough to decide which of these three killer consoles is right for you.

SONY
PlayStation 2
GAMECUBE
XBOX
XBOX

GAMING CONSOLES

< FACT FILE >

Category Tested	Gaming Consoles
Price Range	$199.95 to $299.99
Companies Included	Microsoft, Nintendo, Sony Computer Entertainment America
Editors' Choice	Microsoft Xbox

MICROSOFT XBOX

EDITORS' RATING 8.5

PROS: Solid title selection; built-in broadband; 8GB hard drive; supports high resolutions
CONS: Big, bulky; separate kit required for DVDs; no progressive-scan DVD playback

cnet Editors' Choice

Microsoft's $299 Xbox looks and acts just like a state-of-the-art video-game machine. But with built-in support for high-speed networking, an 8GB hard drive, DVD-playback capabilities, and display support for HDTVs, this black behemoth redefines what a gaming console can do.

Endowed with a front-loading disc tray, two buttons, and four controller ports on its face, the system looks right at home among home-theater components. Inside this 8-pound box you'll find the power of a PC (a 733MHz Intel processor, 64MB of RAM, and a custom nVidia graphics processor, the NV2A), plus the heart of a video-game console.

Video enthusiasts will appreciate that the Xbox works not only with standard televisions but also with HDTVs. If you have an HDTV-ready set, you can set the Xbox to output 480p, 720p, or 1,080i signals in either normal or wide-screen (16-to-9) aspect ratios for your games. The images are crisp and sharp. You'll also like what you hear: The Xbox supports 5.1 Dolby Digital surround sound and delivers 256 simultaneous voice channels—previously unheard of in a game system. All of these advances add up to some of the richest, most realistic video gaming ever.

To get the most out of the system, however, you'll need optional accessories. The Xbox ships with composite-video cables and RCA audio outputs like every other game console. For improved audio and video performance, spring for the $19.99 Advanced AV Pack, which has an S-Video connector as well as optical digital audio jacks. The $19.99 High Definition AV Pack offers component-video connectors (Y, Pb, Pr), plus the optical digital audio jacks. And unlike the PS2, which plays DVDs right out of the box, Xbox owners will need to shell out an additional $29.99 for the DVD Movie Playback Kit. (Note to videophiles: Even with the extra kit, the Xbox won't output your movies in 480p, so hold on to that progressive-scan DVD player.)

While Microsoft makes you pay to unlock some features, it includes some PC-like ones not found in competing systems. A built-in Ethernet adapter sets the stage for broadband multiplayer gaming, regardless of whether you're using a cable modem, DSL, or an office LAN. The console also comes with an 8GB hard drive, so you don't need to buy expensive memory cards to save your game progress. (Proprietary memory cards are available to share files with friends.) The hard drive has other advantages, too. Games load quickly because they can cache levels on the speedy hard drive rather than having to first read all of the game's information from the disc. Another fringe benefit is the ability to drop audio CDs into the unit and copy songs to the drive. You can then use the console to play your music.

Microsoft Xbox

The Microsoft Xbox sells for the same price as the PlayStation 2 and $100 more than the GameCube. Microsoft delivers a lot of power under this hood, as well as some features you won't find on any other console. It's the best choice for those who want the most from their gaming system.

15 Gotta-Have Games

No matter which platform you pick, you'll have a reasonable selection of great games to choose from. Here are some of our favorites.

Microsoft Xbox

1. Halo (Microsoft Games)
2. Oddworld: Munch's Oddysee (Microsoft Games)
3. NFL Fever 2002 (Microsoft Games)
4. Dead or Alive 3 (Tecmo)
5. Project Gotham Racing (Microsoft Games)

Nintendo GameCube

1. Star Wars Rogue Squadron II: Rogue Leader (LucasArts Entertainment)
2. Pikmin (Nintendo)
3. Super Monkey Ball (Sega)
4. Luigi's Mansion (Nintendo)
5. Super Smash Bros. Melee (Nintendo)

Sony PlayStation 2

1. Metal Gear Solid 2: Sons of Liberty (Konami)
2. Grand Theft Auto III (Rockstar Games)
3. Tony Hawk's Pro Skater 3 (Activision)
4. Final Fantasy X (SquareSoft)
5. SSX Tricky (Electronic Arts)

NINTENDO GAMECUBE

EDITORS' RATING 7.9

PROS: Tiny; affordable
CONS: No DVD, audio-CD support

Unlike the PlayStation 2 and Xbox, which aspire to be DVD players and family-room minicomputers, Nintendo's compact GameCube is exclusively a game machine. It's a fun one at that, offering titles suited to a broad audience.

You may be tempted to compare the $199.95 GameCube to a child's lunch box when you see the sturdy plastic handle sprouting from one side. Unlike a lunch box, however, the GameCube is outfitted with four controller ports, as well as a potent 485MHz PowerPC processor and an ATI graphics chip. Under the top cover is a propri-

etary mini-DVD drive. (It cannot play audio CDs or DVDs.) Only one controller comes bundled with the system; it fits comfortably in hands of all sizes and handles like a dream.

GameCube's graphics are impressive. Nintendo includes the standard composite-video cable in the box to hook up the console to your television. Component-video and S-Video connectors are available as accessories for owners of high-end sets. If the game supports it, you can display a progressive-scan picture that packs a wallop. We were able to try out a third-party S-Video connector accessory and found the picture to be remarkably sharp with titles such as Star Wars Rogue Squadron II: Rogue Leader and Luigi's Mansion on both a 4-to-3 Philips CRT as well as a Samsung HDTV-ready Tantus set. Many of the games had a crisp,

Nintendo GameCube

Saturday-morning-cartoon-style look to them, as intended.

The GameCube is a decent visual performer, but it lacks the big audio dynamite of digital audio outputs. The lack of digital outputs is another probable cost-reducing maneuver, but it can hopefully be addressed with a different cable output. But that output is an extra, like many others, that won't be for sale immediately.

The GameCube has neither an internal hard drive nor the promise of one in the future. Instead, you'll need to buy extra memory cards to save your progress in games. And while the machine has slots for a modem or a broadband adapter, no official word has been spoken yet on when those accessories will be available. Nintendo's answer for now is a vague "sometime in 2002."

The Nintendo GameCube is well-positioned for younger gamers and families, but its survival depends on the arrival of addictive titles. It was short on must-have games at launch, but that's changing. Hot games will be crucial, because with no extra features to speak of, the GameCube faces an uphill battle against the well-entrenched PS2 and the upstart Xbox.

SONY PLAYSTATION 2

EDITORS' RATING 8.3

PROS: Sleek; lots of good games; DVD playback
CONS: Lacks Internet connection, hard drive

With a year's head start on the Xbox and GameCube, the $299.99 Sony PlayStation 2 platform has one big advantage over the competition: more quality games than the other two consoles combined. Plus, it doubles as a DVD player right out of the box. Factor in the impending arrival of an optional hard drive and Internet connectivity, and you're looking at an appealing console.

The PS2 can stand on its side or lie flat to fit any space. Once it's installed in your home theater, you'll be treated to a reasonably sharp picture and high-quality sound. Like its competitors, the PS2 has a composite A/V cord in the box, which you use to connect the console to your television. S-Video and component-video connectors are available separately for those who demand better picture quality. A built-in optical digital audio jack delivers surround-sound audio. The system doesn't support HDTV resolutions as the Xbox does, but it can be configured for 16-to-9 wide-screen televisions. You won't find many games that truly take advantage of this feature, however.

Compared with the Xbox, the PS2's 128-bit Emotion Engine yields in-game graphics with more jagged edges. People playing on an ordinary television aren't too likely to notice these flaws, but if you compare the two systems on a high-resolution, HDTV-ready set, the edges in Xbox games look significantly smoother. In many ways, even the little GameCube graphically surpasses the PS2. Star Wars Rogue Squadron II: Rogue Leader and Luigi's Mansion look exceedingly crisp on the GameCube, and the animation in Batman: Vengeance is smoother than it is in the PS2 version.

Although the PS2 can play DVDs out of the box, it's not a very good DVD-movie machine. Image quality is passable, but the PS2 enables almost no picture adjustments and only rudimentary playback controls. A $19.99 DVD remote-control kit adds many of the missing playback features.

< FEATURE COMPARISON >

	Microsoft Xbox	Nintendo GameCube	Sony PlayStation 2
LIST PRICE	**$299**	**$199.95**	**$299.99**
SPECIFICATIONS			
CPU	733MHz Intel Pentium III	485MHz IBM PowerPC	295MHz Toshiba/Sony Emotion Engine
Graphics Processor	250MHz nVidia NV2A	162MHz ATI Flipper	147.5MHz Graphics Synthesizer
System Memory	64MB DDR	24MB 1T-SRAM, 16MB DRAM	32MB RDRAM
External Storage	8MB	8MB	8MB
Internal Storage	8GB	None	None
Disc Drive	DVD-ROM	Proprietary 3-inch disc	DVD-ROM
Sound Processor	256 voices, 64 3D audio channels	64 audio channels at 48KHz	48 audio channels at 48KHz
Internet Connectivity	Built-in 100mbps Ethernet	None	Add-on 56kbps, broadband
DVD/Audio-CD Support	Yes (with $29.99 kit)/yes	No/no	Yes/yes
TV Resolutions	480i, 480p, 720p, 1,080i	480i, 480p	480i, 480p
Wide-Screen (16-to-9) Game Support	Yes	Yes	Yes
Progressive-Scan Game Support	Yes	Yes	No
Controller Ports/Controllers Included	Four/one	Four/one	Two/one
Video Outputs (Standard)	Composite A/V	Composite A/V	Composite A/V
Optional Video Outputs	Component, S-Video	Component, S-Video, DVI	Component, S-Video
Digital Audio Output	Yes (with optional A/V kit)	No	Yes
Other Outputs	None	Two serial, one Hi-Speed	Optical digital out, two USB, IEEE 1394 (FireWire/i.Link), PC Card Type III slot
Dimensions (HWD, Inches)	4x12x8	4.3x5.9x6.3	3x12x7
Weight (Pounds)	8	2.9	5.5
SERVICE AND SUPPORT			
Length of Parts/Labor Warranty	90 days	One year	90 days
Toll-Free Technical Support	Yes	Yes	Yes
Technical-Support Hours (ET)	9 a.m. to 1 a.m. daily	9 a.m. to midnight M-Sa, 9 a.m. to 10 p.m. Su	9 a.m. to 11 p.m. M-Sa, 10 a.m. to 9:30 p.m. Su

Sony PlayStation 2

Beyond home-theater integration, you'll find two USB plugs and one IEEE 1394 (FireWire/i.Link) port on the front. With these comes a world of possibilities. If you plug in a USB Ethernet adapter, you can challenge your friends in Tony Hawk's Pro Skater 3 over a LAN or the Internet. Gran Turismo 3: A-Spec lets you connect up to six PS2s to an IEEE 1394 hub for head-to-head racing. Support for digital cameras, keyboards, and mice is also in the works.

One notable shortfall: The PS2 has only two controller ports, whereas the Xbox and GameCube have four. You'll need to spend an additional $34.99 on a four-player Multitap module to get all your friends in the game. We also would have liked to see a Memory Stick slot, considering that the PS2 is a Sony product. Memory Sticks hold much more data and cost less per megabyte than PS2 memory cards.

Sony hasn't announced exactly when a hard drive and online support will be available, but their addition would allow for not only online gaming but also episodic gaming—you could download, for instance, new tracks and cars for a racing game or new team updates for sports titles. Until then, the Sony PlayStation 2 is a compelling choice for those who want access to the broadest selection of games.

PLAY YOUR WAY

Gamers looking for a console that can be the centerpiece of their home theater should check out the Microsoft Xbox or the Sony PlayStation 2.

The Xbox doesn't currently support online gaming, but it does come with both a hard drive and a built-in broadband adapter for essentially the same price as the PS2. From a sheer hardware-performance standpoint, the Xbox has more muscle, but the PS2 currently has the bigger stable of software. If your biggest priority is the widest selection of quality games available right now, the PS2 is your best choice—for the moment. A year from now, the Xbox may very well have the upper hand in both respects.

Players on a tighter budget should check out Nintendo's more affordable GameCube—it offers great graphics, good performance, and a handful of fantastic games, but few extras. ▼

PeripheralPossibilities

Here's an overview of optional add-ons you can find today, plus others that may be available soon.

Microsoft Xbox

In Control: Some third-party gamepads are wireless and have rubberized grips; others come in unusual shapes. Prices start at about $20.

Be the Wheelman: Check out steering-wheel sets from Mad Catz, Thrustmaster, Pelican Accessories, and InterAct Accessories.

Take Flight: You'll find flight sticks from Thrustmaster, Mad Catz, and InterAct.

Speak Up: Look for Microsoft's Game Commander when the Xbox's online service goes live. It will enable you to talk to other players.

Nintendo GameCube

Picture Perfection: InterAct Accessories' Mobile Monitor 5.4 ($129.99) is the perfect portable screen for the tiny, ready-to-tote GameCube. Strap this to the top of the console, plug in the power supply, and watch your GameCube titles on a 5.4-inch LCD.

In Control: Numerous gamepads are in the works. Consider Nintendo's wireless Wavebird, which will work up to 30 feet from the system.

Memory Matters: Nintendo may market a console that uses standard Secure Digital/MultiMediaCard memory cards instead of the expensive proprietary cards.

Wired: Underneath the GameCube are several covered ports: two serial and one "Hi-Speed" port. The Hi-Speed port is where the hard drive will eventually connect, while the serial ports will accommodate 56kbps modems and broadband adapters.

Sony PlayStation 2

Showtime: A $19.99 Component A/V Cable kit delivers a cleaner image for home-theater environments.

Movie Time: Sony's $19.99 PS2 DVD Remote Controller Kit with updated DVD controls brings the PS2 up to par with most low-end DVD players. Other companies' DVD remotes lack the updated PS2 drivers.

Kung Fool: Thrustmaster's $79.99 Fighting-Arena is the wackiest controller around. Work up a sweat playing boxing, fighting, and even dancing games with this mat controller.

Thrustmaster NASCAR Pro Victory (Xbox)

InterAct LCD Mobile Monitor 5.4 (GameCube)

Sony PS2 DVD Remote Controller Kit (PlayStation2)

< PRODUCT SUMMARY >

EDITORS' RATING (Rated 1 to 10)	8.5	7.9	8.3
PRODUCT	Microsoft Xbox	Nintendo GameCube	Sony PlayStation 2
COMPANY	Microsoft 800-469-9269 *www.xbox.com*	Nintendo 800-255-3700 *www.nintendo.com*	Sony Computer Entertainment America 800-345-7669 *us.playstation.com*
LIST PRICE	$299 35279	$199.95 35280	$299.99 35281

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SERVICE AND SUPPORT

Arm yourself with a plan to get the most out of tech support before you call.

Service... Please!

BY OLIVER RIST

All was quiet as Kelley Griffith booted up her new Dell Dimension 6300 back in October. But the silence wasn't due to her muted anticipation—it was because of a dysfunctional sound card.

Repeated calls to Dell's tech support didn't help the PC pipe up. Griffith had to disconnect the support rep during every call to free up her only phone line to download drivers. Six weeks, 13 tech-support reps, and 23 driver downloads later, the system remained stubbornly silent. Worse yet, each rep insisted on running her through the same support script despite her previous calls. And when she asked to return the PC in mid-November, Griffith was told she'd missed the 30-day return window.

Finally, in early January, she abandoned tech support and asked customer service what she should do. The first rep told her to buy a sound card at Best Buy and install it herself. "I just can't believe he said that," she says. Stunned, she hung up, called again, and demanded a supervisor. Only then did Griffith convince Dell to ship her a new PC.

Stories like this abound both on the

ILLUSTRATION BY FRANCESCO SANTALUCIA

IN CASE OF PC CRASH
WARRANTY
Terms and Conditions
Packing Inventory

Web and probably among your friends and co-workers. And the problem isn't limited to Dell. In fact, Dell's tech support consistently ranks highest among PC vendors.

The truth is tech support is both difficult and expensive. A sagging economy has corporate bean counters running around with red pencils looking for costs to slash. Free tech support is a prime target because it doesn't generate revenue.

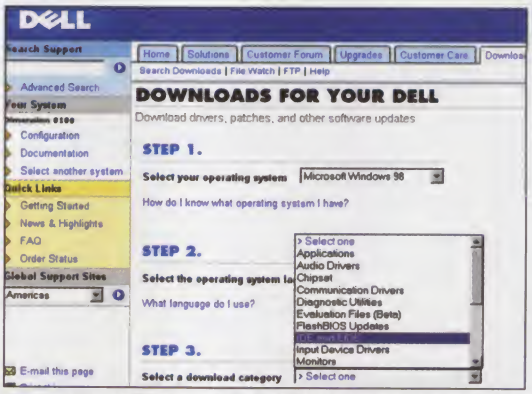
The PC industry's quality standards are among the worst of any manufacturing industry, and this places a tremendous burden on vendors' tech-support departments. Your own tech-support headaches could be waiting in the delivery truck outside your door. Here's how to minimize the Muzak loops of "Back in the U.S.S.R."

KNOW WHAT YOU'VE GOT

When you call tech support and actually reach a human, that person is usually working off a script. This series of standard questions and responses is designed to get to the root of your problem, its solution, and the end of the call as quickly as possible. Your goal is the same. To help you achieve it, you should know what rights you have with the manufacturer before you place the call. You'll find details of these rights in the documentation that came with your PC.

The documentation includes a warranty card, a document labeled "Terms and Conditions," and a registration card. The warranty card describes what the warranty covers, and Terms and Conditions tells you when the warranty applies and when it doesn't. Familiarize yourself with these first two documents, and fill out and mail the registration card. Yes, it's something of a marketing ploy and an invasion of privacy, but it saves you time when you have to call the company.

A typical PC-support policy covers you against hardware failure for one year. Tier 2 players such as MicronPC require you to ship the product back for repair or replacement. Top vendors such as Compaq, Dell, Gateway, HP, and IBM offer repair or replacement either onsite (or in-store, if applicable) or by shipping the product back to the company, but only at their discretion. After evaluating your problem, a company technician determines which action to take. You can bet costly onsite service won't come up very often. This discretion also extends to repair versus replacement. According to ex-tech-support staffers on two PC-support newsgroups (Dell and Compaq), an exchange occurs only after a customer has called three times with the same problem, and then usually only with a supervisor's approval.



Like most large PC vendors, Dell offers a variety of downloadable drivers, patches, and other software updates on its Web site.

Reading and setting aside your warranty and Terms & Conditions documents are good early steps in preparing for tech-support problems. Make sure you keep all warranty-related documents in a handy place; a manila folder labeled "PC Crash" is a good choice. In addition to the warranty card and Terms and Conditions document, throw in the packing and hardware inventory list, which should include a list of installed components along with their serial numbers. Another item for the file is a list of phone numbers (both toll-free and toll), URLs, and e-mail addresses for every tech-support venue the company supports. If you bought a Gateway, for instance, include the number of your local Gateway Country retail store; for Compaq or IBM, perhaps the local CompUSA, if you purchased it there. Make sure you include phone numbers and not just URLs, because if your PC is dead or you can't get online, URLs are useless.

> **Make sure you keep all warranty-related documents in a handy place; a manila folder labeled "PC Crash" is a good choice.**

SELF HELP

Now that you're armed with all this information, you're ready to make the call to tech support. Still, there's a chance you may not have to. If you're able to access the Web, you may be able to fix the problem yourself. Because of the high cost of onsite service calls, PC vendors have instituted all kinds of ways to try and avoid them, including reaching out across the Web and taking control of your PC. Dell calls it Resolution Assistant, but similar technology is available from all the big PC makers, including Compaq, IBM, and HP. By accessing your PC via software remote-control technology, support technicians can get much more detailed information on your configuration, especially any changes and additions you've made since your purchase. This technology can be a valuable tool when your productivity is on the line. You may even want to test it before you need it to make sure it works as advertised.

A similar technology that comes with most new PCs is a "self-healing" capability. Computer makers such Dell and Compaq can configure your PC to check their support Web sites periodically while you're online. The technology looks for updated drivers, OS patches, and component warnings for your configuration, and asks if you'd like to download the necessary patch or fix.

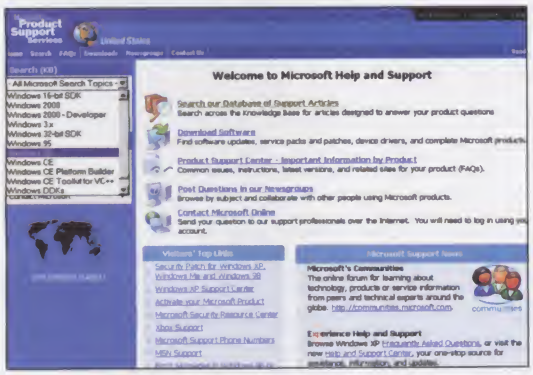
On some PCs you can set up the feature to download fixes automatically, but doing so isn't wise. Too many Windows fixes, for instance, can clash with drivers for new PCs' advanced video and sound subsystems. You're better off monitoring the list of suggested fixes, and downloading and installing them yourself. This way, should problems or conflicts crop up, you'll have a better idea what triggered them.

Look for self-healing technology to become more commonplace in the coming year. Microsoft has built the feature into Windows XP, along with hooks for third-party manufacturers to

come along for the ride.

Another place to look for answers before you place the call is the knowledge base on your vendor's support site. PC vendors are offering more and more information on their sites in an effort to bring down the soaring labor costs associated with live tech support. You'll be surprised at all you're able to find.

Admittedly, the quality of some PC makers' knowledge bases is questionable, but recent updates to the support sites of Dell, Gateway, Compaq, and others indicate these resources are becoming increasingly useful. Many FAQs have turned into outright tutorials, and driver-download lists now come with helpful instructions instead of long lists of FTP links. Companies such as Gateway have begun offering chat-based support links in addition to Web-based e-mail. These links offer more than just technical support; they act as guides to what's available on the site or even sales help. At press time, Gateway was in the process of beefing up its tech-support site with even more new features.



Microsoft's searchable knowledge base contains solutions to thousands of common system problems. It's a good first stop when trouble strikes.

BUY MORE TIME

If you feel uncomfortable with the length of the standard warranty policy your vendor offers, you can always upgrade to an extended policy for additional cost. Long dismissed as nothing more than a way for a manufacturer to make some extra cash, the extended warranty may be your best bet for getting at least a baseline of guaranteed service from your PC manufacturer. That's because premium tech support is a profit center, and as such it may be less of a target for service cuts.

Before you commit to an extended warranty, read the policy carefully. You'll see phrases like "limited one year" to describe the standard warranty and "extended three year" to describe a premium warranty. The latter implies you're buying a juicier warranty policy, but usually you're just adding an extra year or two to the standard policy. That means even if you see "third-party onsite service" mentioned in the premium policy, it's still at the company's discretion. Only warranties that specifically delineate when a technician will call and where service will be performed guarantee you in-person help at your request. And these types of warranties are often available only to business buyers.

You may not have to decide right away whether you'd like to buy an extended warranty. Read your Terms and Conditions document as well as the vendor's support Web pages. Often the vendor lets you purchase an extended warranty as long as the standard warranty hasn't expired. And even if it has expired, some vendors, including IBM, still allow extended-warranty purchases in some situations.

Several vendors are also offering additional support-related services you may find worthwhile. Gateway, for instance, provides in-home installation. For a few extra dollars, a certified technician will set up your PC at the time of delivery. This may sound like a waste of money to tech-savvy *Computer Shopper* readers, but it'll save you a house call if the computer is for your mother-in-law.

10 Steps to Getting the Most Out of a Tech-Support Call

1. Make sure you have all your information handy. This includes your warranty, Terms and Conditions document, hardware packing list with serial numbers, and your general documentation.
2. Check out the obvious prior to making the call. Is the power switch on? Has a circuit breaker been tripped or a cord unplugged?
3. If possible, print or capture any error messages to a text file. If you have enough PC left to send an e-mail, this information can help the technician.
4. Be calm. The technician is looking to solve your problem as quickly (and thus, cheaply) as possible. Launching into a lengthy rant about product quality will push the technician toward sloughing you off on someone else.
5. Write down everything: how long you were on hold, the tech's full name, every method he or she tried, the results, any case numbers or trouble-ticket numbers assigned to your problem.
6. If the first call doesn't work, try another form of communication. Often the workers behind e-mail or chat support are different from those on the phone. Again, record everything, and remain calm.
7. Check out support newsgroups that cover your product. Pose your problem there, and see what comes back. Often, checking a newsgroup can help you better steer a technician during subsequent calls.
8. Be firm in subsequent calls—don't let the technician run through the same script as during your first call until stumbling at the same spot. Note where you left off on the last call, and provide your case or trouble-ticket number.
9. If the technician can't help, escalate (ask for a supervisor), but do so calmly. You're now talking to someone not only more powerful but more knowledgeable. If the product just isn't fixable, a supervisor can expedite repairs or even authorize a product exchange.
10. If the supervisor refuses to or can't help, don't just stop calling. Calling at another time means getting another supervisor and another chance at better help. It also means getting still more information about your problem that you can give to a third-party technician if that becomes necessary.

SERVICE AND SUPPORT

THE KINDNESS OF STRANGERS

If you've given up hope of getting satisfactory warranty service of any kind, you may consider paying a third party as a last resort. If you have Internet access, competent tech-support help is only a mouse click (and a credit-card number) away. One of the best sites for home users is Ask Dr. Tech *(www.askdrtech.com)*. In addition to per-incident support, the company offers annual plans for $89 and $129 depending on services. You even get a toll-free number in case you lose Web access.

Similar solutions are available from sites such as Expertcity *(www.expertcity.com)* and PCsupport.com *(www.pcsupport.com)*, but most have begun focusing on business clients. PCsupport.com, for instance, which offered limited free services to consumers, has switched to a pay-as-you-go methodology aimed at corporate America.

Ask Dr. Tech offers supplementary support plans for $89 or $129 a year depending on services, and includes a toll-free tech-help number in case you lose Web access.

Web sites aren't your only third-party option, however. Many local computer stores also offer support for a fee. For large retailers such as CompUSA, as well as local mom and pops, tech support provides an excellent source of revenue. CompUSA, for instance, will service any brand it sells. If you didn't purchase it there or your warranty has expired, however, be prepared to shell out around $40 per hour for labor. In addition, CompUSA's 24/7 Dial-a-Tech division provides pay-as-you-go phone support service.

You may be able to find other tech-support sources by asking around at local user groups, business gatherings, and similar events. If you see an advertisement for tech-support services, tear it out and throw it in your PC Crash folder.

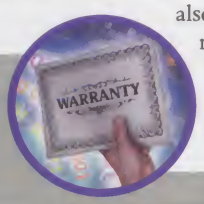
In addition to fixing broken hardware, many storefront operations will upgrade operating systems and firmware, install new components, and even handle minor networking issues.

Be wary of rip-offs, though. The pursuit of tech-support-related revenue has spawned a number of questionable services. Both CompUSA and Gateway, for instance, offer PC tune-up services and recommend all PCs undergo such servicing once a year. The service boils down to little more than an internal dusting and a disk defrag. It probably can't hurt, but is it worth $50? You can get much more thorough maintenance help from sites such as PC Pitstop *(www.pcpitstop.com)* or CNET CatchUp *(catchup.cnet.com)*. (CNET Networks is *Computer Shopper's* parent company.)

Why hasn't third-party support become a boom industry in this computercentric age? The answer lies in its additional cost. Many folks won't even consider paying for third-party support because they view having to call tech support as a failing the vendor is obligated to correct. Why should they shell out money for a service they're due?

Getting the free service you're due, however, often requires vast amounts of free time and patience. Because the odds of requiring tech support are good, leave yourself as many easily accessible options as possible and accept the reality that what's owed to you in a perfect world isn't always what you're going to get. Having a "PC Crash" folder isn't paranoid; it's practical. ▼

Warranty-Translation Lessons



AVERAGE SPEED OF ANSWER (ASA) The average time required for an analyst or automated response tool to respond to an incoming call.

AVERAGE WAIT TIME The average length of time a caller spends on hold before abandoning the call or being helped by an agent. Also called average hold time.

CALL MONITORING The practice of listening in on live calls, ostensibly as an aid in training novice help-desk or support-center agents and ensuring consistent customer service.

ELECTRONIC SOFTWARE DISTRIBUTION The process of remotely uploading software programs or upgrades to a customer's computer.

ELEVATION The process of assigning a service request to a higher technical-support level.

ESCALATION The process of giving a call more priority, urgency, or resources due to the impact or timing of the request, customer input, or duration.

LIMITED WARRANTY A warranty limited by the vendor as detailed in your warranty agreement and Terms and Conditions statement. Almost all warranties are "limited."

NEXT-DAY, ONSITE The vendor will send a technician to your home or business within 8 hours of the call. Response time depends on factors such as customer availability, location, and resource availability.

OEM Original equipment manufacturer.

ONSITE SERVICE The manufacturer will send a technician to your home or office.

RETURN TO DEPOT The requirement to pack up your system and ship it to an authorized center, depot, or vendor location for repairs.

THIRD-PARTY SOFTWARE OR PERIPHERALS Any peripheral, accessory, or application sold by a computer vendor that does not carry that vendor's brand name.

Sources: Dell Computer, Help Desk Institute, Sun Microsystems

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rock your world

The expanding galaxy of digital audio players keeps your music moving with you.

BY RICK BROIDA

Thanks to the wide array of digital audio devices, your music collection can accompany you anywhere—around the block, to the gym, on the bus, or to the dentist's office.

Creating your own digital playlists is not a complicated or time-consuming endeavor, either. Gone are the days of laboriously copying album tracks in real time onto cassette tapes. Nowadays, transporting your tunes usually involves little more than ripping tracks from CDs or downloading songs from the Internet to your PC, and transferring files to blank CDs or portable players. Once your music library has found a permanent home on your hard drive, it's a simple matter to share it with multiple devices: MP3 players, multiformat CD players, portable DVD players, even your home stereo system.

THE MP3 REVOLUTION

For those who like to travel light, nothing tops an MP3 player. Whether you choose a "traditional" model that stores music in nonvolatile flash memory, such as the Sonicblue Rio 800, or one of the newer units that rely on a built-in hard drive, like Apple's iPod, it's sure to be smaller and lighter than the personal cassette players of yesteryear. Even the $399 iPod, which has the capacity to store about 1,000 songs (at a default 160kbps encoding rate), is just a bit bigger than a deck of cards and

Rio
Imation

SHOPPER'S GUIDE TO DIGITAL AUDIO PLAYERS

Bantam Interactive BA350

weighs only 6.5 ounces.

When shopping for an MP3 player, storage capacity may be an even more important consideration than size. Flash-memory models such as the Rio 800, which sells for $219.95, typically offer 64MB or 128MB of internal storage—enough to hold approximately one or two hours of CD-quality audio, respectively—with additional storage available courtesy of memory cards. The Rio uses proprietary and expensive memory Backpacks, but most other players rely on industry-standard CompactFlash, SmartMedia, or Secure Digital media. The $199.99 Creative Nomad II MG, for instance, provides 64MB of flash memory and a SmartMedia slot for adding up to 64MB more.

Of course, two hours of music won't cut it when you're flying coast to coast. If you want to pocket an entire library of tunes, you'll need a hard drive-based model such as the iPod (which, at press time, worked only with Macintosh systems) or Archos Jukebox 6000 ($249). These units have 5GB and 6GB hard drives, respectively—enough for holding 100 to 150 CDs. (That's *CDs*, not songs.)

Given that the Jukebox 6000 costs about the same as a Nomad II MG and a 64MB SmartMedia card, why would anyone opt for the Nomad? Without question, hard drive-based players may bring down the curtain on removable-memory models. But the Rio, Nomad, and others of its kind have an ace in the hole: skip-free operation. Because they have no moving parts, you can shake them like spray-paint cans without hearing so much as a hiccup—great for runners and other physically active folks.

They also tend to be significantly smaller than hard drive players. Witness the Bantam Interactive BA350 ($199), which is no larger than a credit card and barely half an inch thick. It has 128MB of memory, a battery that recharges via its USB connection to your PC, swappable color faceplates, and a MultiMediaCard (MMC) slot for extra storage. And it weighs just a hair more than 2 ounces.

Even so, it's difficult to reject the roominess of players such as the Jukebox 6000, which can also function as a portable hard drive—perfect for shuttling large files between PCs. It's a bit too heavy and bulky to fit comfortably in a pocket, and you shouldn't run with it, but otherwise it's a terrific way to transport whole music

Apple iPod

Most Valuable Players

PLAYER TYPE/PRICE	BEST BETS	FORMATS SUPPORTED	MEDIA USED	PROS	CONS	BOTTOM LINE
Flash-Based MP3 $80 to $300	Bantam Interactive BA350	MP3 (some models also support WMA)	Varies (CompactFlash, SmartMedia, MMC/SD)	Skip-free operation; small and lightweight	Far less storage capacity than that of hard drive players	Flash-based players are a great solution for athletes and those who like to travel light.
Hard Drive-Based MP3 $250 to $600	Apple iPod	MP3	Internal hard drive	Can store hundreds of hours of music	Bigger and heavier than flash players; not always skip-proof	These convenient players are the future of portable music.
Multiformat CD $90 to $400	iRiver iMP-350 SlimX	CD-Audio, MP3 (some models also support WMA)	Audio CDs, CD-R, CD-RW	Can carry up to 150 songs on a single CD	Some players are bulky; inadequate displays	These units are awesome for those who can't afford a hard drive-based player but still want hours of music.
Home DVD $80 to $300	Panasonic DVD-RP56	CD-Audio, MP3	DVD, audio CDs, CD-R, CD-RW	Plays MP3-packed CDs on your home theater system	Limited playback options; inadequate display of folder or song info	A no-brainer: Make sure your next home DVD player supports MP3.
Portable DVD $530 to $1,200	Audiovox D1700	CD-Audio, MP3	DVD, audio CDs, CD-R, CD-RW	Plays MP3 CDs when you're tired of movies	No display of folder or song info on first-generation players	A movie theater and jukebox all in one means you can beat the airport blues for good.
MiniDisc $150 to $350	Sony NetMD Walkman	ATRAC3, MP3, most other audio codecs	MiniDisc	Latest players offer long-play compression, skip-free operation; inexpensive media	Most units record in real time; high prices	Although Sony has finally delivered the perfect MiniDisc player, the NetMD Walkman, this format still has a limited audience.
Digital Jukebox $1,000 to $1,500	HP Digital Entertainment Center DE100C	Varies	Internal hard drive	Bridges the gap between PC, stereo, and Internet to provide endless audio options	Expensive	It's too soon to tell if these entertainment hubs will catch on, but we want our next home to have one.

Sonicblue RioVolt SP250

libraries. If you're really into music, check out the $369 Archos Jukebox Recorder 20. It not only doubles as an MP3 recorder, but it also has a whopping 20GB hard drive.

Finally, be on the lookout for desirable extras such as an FM tuner, voice-recording capabilities, and support for additional digital audio formats like WMA. Features like these can be found on both kinds of MP3 players. The Nomad II MG, for instance, provides an FM tuner, while the Jukebox Recorder 20 includes a built-in microphone for voice recordings.

THINK SMALL

Portable CD players have been the rage for over a decade, but it's only in the last year or so that they've added MP3 support to the equation. Specifically, many so-called multiformat players now let you spin CD-R and CD-RW discs packed with MP3 files. That translates to 10 hours or more of music on a single CD. Small wonder that players such as the Sonicblue RioVolt SP250 ($179.95) and Likko LKM103 ID3 SuperStar ($89) have proved so popular. The RioVolt comes loaded with amenities, including a high-resolution backlit display, support for WMA files, and a built-in FM tuner. The ID3 SuperStar lacks such frills, but it does have a surprisingly solid feature set for a bargain-price player.

Whichever model you buy, make sure it includes a few key capabilities. If it doesn't display ID3 tags—most first-generation players didn't—you won't be able to see the artist names and song titles on your CDs. Equally important is folder support, a crucial element when you're trying to navigate a playlist of 150-odd songs. Rechargeable batteries or at least an AC adapter are another plus, as CD players tend to run out of juice more rapidly than flash-memory MP3 players.

If you want the benefits of a CD/MP3 player without the bulk, consider a mini-CD model. The Philips 8cm eXpanium EXP401 ($179) plays 3-inch (also known as 8cm) CD-R and CD-RW media, which can hold 185MB of data, or about three hours' worth of 128-bit MP3 tracks. It includes shock protection and an LCD, but it doesn't support ID3 tags; folders and tracks are displayed numerically.

If you're on a budget, check out A-Max Technology's Napa MCD380 ($99), which not only supports ID3 tags, but measures only 4 inches square and an inch thick. If you're looking for an easy way to burn and play mini-CDs, check out the $399.99 Imation RipGo. It's a mini-CD player that can also link to your PC or Mac for on-the-fly music copying. (For a full review of the RipGo, see this month's Reviews section.)

Toshiba SD2710

MOVIES AND MORE

Now that the DVD revolution is in full swing, make sure the next player you buy, whether it's part of a home theater system or a portable model, includes support for CD-R and CD-RW media. Many newer models do, meaning they can double as audio players, spinning the same MP3-packed discs you carry in your multiformat CD player.

The Toshiba SD2710 ($229.99) offers the usual array of features found in home DVD players, but it also plays MP3 files. The hitch is that it doesn't display track names, and you can't see the track number unless your TV is on. Because MP3 playback is reasonably new to DVD players, don't expect a lot of fancy features such as shuffle play and support for folders.

It's a similar story with portable DVD players such as the Audiovox D1700 ($530), which, despite the presence of a roomy 7-inch color screen, displays not a whit of information about the songs you're playing or the folder structure of the CD-R media. Still, when you're tired of movies, it's nice to be able to pop in a CD packed with 10 hours of music.

THE MINIDISC MAKEOVER

Though wildly popular in Japan and Europe, Sony's MiniDisc (MD) platform has largely flown beneath the radar in the United States because of the high prices of the hardware, the raging popularity of MP3, and confusion over the devices' intended use. Indeed, Sony admits that when MD debuted in 1992, consumers didn't really know what to make of it. Was it the successor to the compact disc or a

Digital Deliberations

The war over digital music is far from over. Although Internet file-sharing services like MusicCity.com, Morpheus, LimeWire, and WinMX have filled the gap left by Napster, the recording industry continues to crack down on music piracy.

Last October, the Recording Industry Association of America (RIAA) and Motion Picture Association of America (MPAA) filed suit to shut down the MusicCity.com, Grokster, and KaZaA networks. At press time, all three entities were still operating, and the Electronic Frontier Foundation stepped in to defend MusicCity against the copyright-infringement charges.

The record labels don't want you making copies of your CDs, either. Last December, Universal Music Group added copy protection to the sequel to the soundtrack of *The Fast and the Furious* as part of an open test of antipiracy technology. Tracks from the CD can't be copied, and a special software player is required to listen to them on a PC. In January, U.S. Representative Rick Boucher (D-Va.) sent a letter to the RIAA suggesting that CD copy protection might violate personal-use laws enacted in 1992. (See Rik Fairlie's column in the Opinions section for more on copy-proof CDs.)

Sony NetMD Walkman

replacement for the tape deck? Would MD albums make CD collections obsolete?

Eventually, portable MD players, which can play CD-quality audio from 2.5-inch media, carved a niche for users looking to create mixes of their favorite CDs. But then came the MP3 boom, which relegated the MiniDisc even farther into the fringes. It wasn't until 1999 and the arrival of a third-party PC-to-MD adapter—the Xitel MD-Port, which Sony now bundles as the PCLink—that the technology finally took off, allowing users to copy MP3 files to their players.

In fact, it's possible to transfer virtually any digital music format to an MD player, thanks to software that automatically converts audio files to Sony's proprietary ATRAC3 format. Instead of having to pull songs solely from your CDs, you can leverage all manner of Internet audio. Most portable MD players can also record from tape decks, record players, stereo receivers, and almost any other audio source. What's more, songs stored on an MD can be rearranged, edited, and deleted—functions no MP3 player can match.

Sony has also developed new compression methods to increase the media's 80-minute storage capacity. The latest, MDLP4, quadruples it, for up to 320 minutes of music packed onto a disc that costs about $2. The hitch? Sound quality no longer matches that of a CD, but instead comes closer to FM radio. Even so, to store five hours of similar-quality music on an MP3 player, you'd need at least a 128MB memory card, at a price of $60 to $150, depending on the media.

Clear benefits of MD players are the shock-absorbing technology, which makes them suitable for jogging and other athletic activities, and the inexpensive discs, which make it affordable to carry large libraries of music. In addition, the improved compression reduces the number of MiniDiscs you need to carry. And the players themselves—available not just from Sony, but from Aiwa and Sharp, as well—can be had for as little as $150 (though newer features like MDLP4 are available only on the latest players, which cost about $250).

Sony's latest model, the NetMD Walkman, should be available just about the time you read this. With it, Sony eliminates MD's only remaining shortcoming: real-time recording. Now instead of spending 80 minutes recording 80 minutes' worth of music to an MD, you can accomplish the task in a fraction of the time. Sony promises up to a 32x recording speed.

HP Digital Entertainment Center DE100C

BRINGING IT ALL BACK HOME

Digital technology is not only transforming portable audio systems; your home stereo system is about to get a major shot in the arm as well.

By leveraging increasingly common technologies such as Ethernet and broadband, products like the Hewlett-Packard Digital Entertainment Center DE100C ($999.99) and Sonicblue's Rio Advanced Digital Audio Center ($1,499) will rip songs straight from your CDs, play music stored on a giant hard drive, and much more.

Think of them as TiVo systems for your stereo, or the digital frontier for your music collection. Either way, while these first-generation efforts are certainly pricey, they're sure to please serious audiophiles. ▼

< ESSENTIAL CNET DOWNLOADS >

Acoustica MP3 To Wave Converter Plus
Convert your MP3 files into WAV files.

LimeWire
Search for and share all kinds of files using the Gnutella network.

Rosoft CD Extractor
Rip and encode your CDs into MP3 files.

DOWNLOAD THEM NOW FROM *download.com/shopper*

Push-Button Preservation

When attorney Jack Nolish set out to preserve old recordings of his father's jazz band, he knew he would have to convert the old, decaying, reel-to-reel tapes to a digital format. What he didn't know was how easy it would be. After exploring various tape-to-stereo-to-PC solutions, he discovered the Archos Jukebox Recorder 20 ***(www.archos.com/us)***, a portable MP3 player/recorder.

Unlike other PC-based digital recorders, the Jukebox Recorder can record real-time MP3 files from any amplified audio source onto its built-in hard drive. Instead of lugging the heavy open-reel tape deck to his PC and fooling around with sound-card settings and audio software, Nolish simply used the Jukebox Recorder's included audio cable to connect the deck to the MP3 recorder. Once the tapes were recorded as MP3 files, Nolish plugged the USB device into his PC and dragged the recordings to his hard drive. From there he used audio-editing software to clean up the tracks before burning them to CDs to share with other family members.

Archos Jukebox Recorder 20

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- V.92 Zoom 56K Fax/Modem
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AMD Athlon™ XP 1700+	$1159
AMD Athlon™ XP 1800+	$1179
AMD Athlon™ XP 1900+	$1239
AMD Athlon™ XP 2000+	$1319
1394 FireWire PCI Card	Add $35
Klipsch ProMedia 5.1 Speakers	Add $229
NewQ Digital Audio System	Add $115
1.0Gb DDR Memory	Add $129
21" .26 Monitor	Add $229
512MB DDR 333MHz Memory	Add $29

INTERNET SURFER-1020

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- AMD Duron™ 1000 MHz Processor
- 256MB PC133 Memory (Up to 1GB)
- 20GB 7200 rpm Ultra ATA-100 HDD
- 12x10x32x Max Variable CD-RW Drive
- 1.44MB 3.5" Floppy Drive
- Savage4 2D/3D Video Accelerator
- 56K V.92 Zoom Internet Call WaitingModem
- Creative CT5880 3D Sound Blaster
- Zoom USB Color Video Camera
- Inwin Tower or Desktop Case
- Black, white and Blue Color Cases availaible
- Creative Labs SBS-15 Stereo Speakers
- Internet Keyboard and Wheel Mouse
- Microsoft Windows ME or 98SE
- Free Upgrade to Windows-XP Home Edition
- VideoLive Mail, Media & Show,
- McAfee AntiVirus CD Bundle Pack
- 3 Years Parts, Lifetime Labor Warranty

AMD Duron™ 1000MHz	$599
AMD Athlon™ XP 1700+	$699
AMD Athlon™ XP 1800+	$719
AMD Athlon™ XP 1900+	$769
AMD Athlon™ XP 2000+	$899
512MB Memory	Add $69
60GB HDD	Add $79
Internet Phone Wizard, PCI	Add $89
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- 1.7GHz Intel® Xeon® Processor
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- 16x Max Variable Speed DVD-ROM Drive
- 1.44MB 3.5" Floppy Drive
- 64MB GeForce2 MX 4xAGP Video
- Creative CT5880 3D Sound Blaster
- V.92 Zoom 56K Fax/Modem
- 10/100 Ethernet Network Card
- Inwin Tower or Desktop Case
- Black,White and Blue Color Cases available
- Cambridge Inspire 2.12-Speakers Set with Subwoofer
- Logitech Keyboard and Wheel Mouse
- Microsoft Windows ME or 98SE
- Free Upgrade to Windows-XP Home Edition
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Pentium®-4 1.9GHz	$999
Pentium®-4 2.0GHz	$1119
Pentium®-4 2.2GHz	$1349
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512MB Memory	Add $69
Microsoft Windows-XP Pro	Add $79
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Creative CT5880 3D Sound Blaster
Built-in HDD/FDD IDE UDMA/100 Controller
3 - 168 Pin SDRAM Memory Slots
1 - 4xAGP Slot, 3 - PCI Slots
Logitech Keyboard and Wheel Mouse

AMD Duron™ 1000MHz	$239
AMD Athlon™ XP 1700+	$329
AMD Athlon™ XP 1800+	$349
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AMD Duron™ 1000MHz	$289
AMD Athlon™ XP 1700+	$379
AMD Athlon™ XP 1800+	$399
AMD Athlon™ XP 1900+	$449
AMD Athlon™ XP 2000+	$535
256MB Crucial DDR Memory	add $69
64MB ATI Radeon-7000	add $69

P-4 ALL-IN-ONE BAREBONE

Inwin ATX Case, w/2 USB Ports.
Black, White and Blue Color Cases available.
Gigabyte 400MHz FSB Motherboard
1.44MB 3.5" Floppy Drive
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Pentium®-4 1.7GHz	$389
Pentium®-4 1.9GHz	$479
Pentium®-4 2.0GHz(512k)	$599
Pentium®-4 2.2GHz(512k)	$789
256MB Crucial DDR Memory	add $69
32MB NVIDIA RIVA M64	add $39

P-4 RAID BAREBONE

Inwin ATX Case, w/2 USB Ports.
Black, White and Blue Color Cases available
Gigabyte 400Mhz FSB Motherboard
1.44MB 3.5" Floppy Drive,
Creative CT5880 3D Sound Card
Built-in HDD/FDD IDE RAID/100 Controller,
4-184pin, 1-4x AGP, 5-PCI Slots,10/100 Ethernet Lan Card, Logitech Keyboard & Wheel Mouse

Pentium®-4 1.6GHz	$425
Pentium®-4 1.7GHz	$459
Pentium®-4 1.9GHz	$545
Pentium®-4 2.0GHz(512k)	$669
Pentium®-4 2.2GHz(512k)	$869
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AMD Athlon™ XP 1700+	$219
AMD Athlon™ XP 1800+	$242
AMD Athlon™ XP 1900+	$297
AMD Athlon™ XP 2000+	$379
Kingston PC133 SDRAM 256MB	$55

GIGABYTE 7VTX-H+ $99

VIA KT266A Chipset, 266MHz Bus Speed, 5-PCI, 1-4xAGP Slot, 3-DDR Memory Slots, 4-USB Ports, Award PnP BIOS, Build-in Creative CT5880 Sound Card, 10/100 Base-T LAN, IDE UDMA/100 and I/O Controller, ATX Form Factor.

AMD Duron™ 1000MHz	$152
AMD Athlon™ XP 1700+	$239
AMD Athlon™ XP 1800+	$262
AMD Athlon™ XP 1900+	$317
AMD Athlon™ XP 1900+	$399
Cricial PC2100 DDR 256MB	add$69

SOYO K7V DRAGON PLUS $139

VIA KT266A Chipset, 266MHz Bus Speed, 5-PCI, 1-4x AGP Pro Slot, 3-DDR Memory Slots, Award PnP BIOS, 4-USB Ports, Build-in RAID/100, IDE UDMA/100, 10/100 Ethernet Lan Card, 6-Channel Digital Audio and I/O Controller, ATX Form Factor.

AMD Duron™ 1000MHz	$195
AMD Athlon™ XP 1700+	$279
AMD Athlon™ XP 1800+	$309
AMD Athlon™ XP 1900+	$359
AMD Athlon™ XP 1900+	$449
Crucial PC2100 DDR 256MB	add$69

ABIT KR7A-RAID $139

VIA KT266A Chipset, 266MHz Bus Speed, 6-PCI, 1-4xAGP Pro Slot, 4-DDR Memory Slots, 4-USB Ports, Award PnP BIOS, Build-in RAID/100, IDE UDMA/100 and I/O Controller, ATX Form Factor.

AMD Duron™ 1000MHz	$199
AMD Athlon™ XP 1700+	$279
AMD Athlon™ XP 1800+	$309
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IMAGE-EDITING SOFTWARE

You don't have to spend a fortune or endure a steep learning curve to perfect your images. Just try one of these four highly capable, user-friendly editors.

by Susan Glinert, Gregg Keizer, and Barbara Krasnoff

ImageMakers

IMAGE-EDITING SOFTWARE

Midlevel image editors blend hand-holding features with much of the power of professional programs that cost hundreds of dollars more. For around $100—potentially much less—you can get a friendly interface, automated image-repair features, and a wide range of robust image-editing tools. What you won't find at this price are the advanced image-tweaking tools and support for four-color (CMYK) print output found in higher-end programs such as Adobe Photoshop.

The four editors we looked at are compatible with a wide range of bitmap formats—including JPG, GIF, TIF, and BMP—and import files directly from scanners and digital cameras. In fact, the boom in digital photography is largely responsible for many of the features you'll see in this roundup, including red-eye repair, automatic image enhancement, slide-show functions, photo catalogs, and the ability to share photographs via the Web or e-mail. You'll also find text and drawing tools for annotating photographs, as well as the capacity to optimize photos for the Web. Three of these programs—Adobe Photoshop Elements, Jasc Paint Shop Pro 7, and Ulead PhotoImpact 7—support layers or objects, which you'll need for compositing, or creating a new photo from several individual ones. For a peek of what you can get at the high end, read the sidebar, "Image Master," on Adobe Photoshop.

ILLUSTRATION BY ERIC YANG

ADOBE PHOTOSHOP ELEMENTS

EDITORS' RATING 6.5

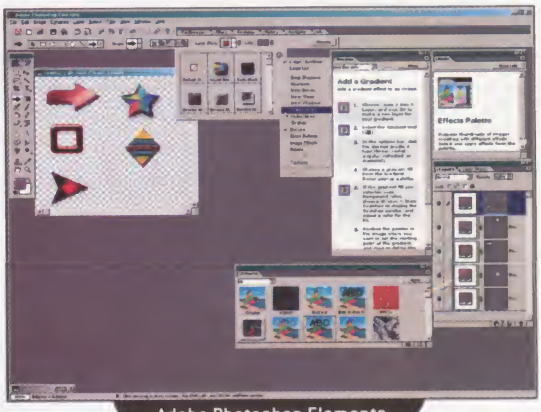
PROS: Excellent context-sensitive help
CONS: Lacks many Web tools; limited color-correction features

Adobe Systems' $99 Photoshop Elements is positioned squarely against Jasc Paint Shop Pro 7, offering an appropriate range of editing features that may appeal to digital photographers, graphics enthusiasts, and business users alike.

Elements is basically Photoshop without CMYK and high-end color-correction support. These professional-level features are replaced by well-designed help palettes and a few interesting functions, such as panorama creation, red-eye removal, and lighting and color-cast adjustment, that digital photographers will appreciate. Scanner users will welcome the automatic straightening and cropping feature, which works like a charm.

Like most image editors, Elements has a floating toolbar and a set of palettes for organizing layers, choosing colors, and navigating around an image. The Effects, Filter, and File Browser palettes conveniently display thumbnails; you can choose an effect, such as a picture frame or Ripple filter, and open or import a file by selecting the appropriate thumbnail. Similarly, the Layer Styles palette shows miniature images of bevels, glows, and drop shadows that you can apply to text or shapes in your image, making Web-button creation a quick, two-step process.

Elements' user assistance takes the form of two floating palettes. The Hints palette displays a context-sensitive illustration and explanatory text. The second helpful palette, Recipes, shows how to perform a variety of tasks with interactive step-by-step instructions. When we clicked the arrow that precedes each step, Elements executed the relevant menu or tool function, so we didn't have to sift through menus to find the command.



Adobe Photoshop Elements

Even with all the help, we didn't find Elements easier to use than Paint Shop

Pro, and Elements gives you fewer features than the Jasc program. But with its task-oriented Recipes and built-in productivity features, Adobe Photoshop Elements may appeal to those who've outgrown the handholding approach of Adobe's lower-end PhotoDeluxe but don't want to invest the time or money in a professional image editor.

JASC PAINT SHOP PRO 7

EDITORS' RATING 7.8

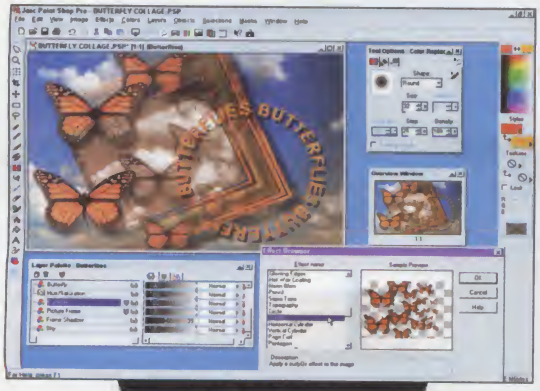
PROS: Easy-to-use special effects; great automatic color adjustment; intuitive vector tools
CONS: Web tools hard to find; no color-match (CMYK) preview; no ICM support

Jasc Software's $109 Paint Shop Pro 7 is feature-packed and robust enough for professional-caliber image editing, yet easy enough for artists of all skill levels.

The program's help is beautifully organized, but Paint Shop Pro's interface is so straightforward that you won't need assistance with most common tasks. Version 7 has even added menu commands that automatically remove red-eye and fix blemishes caused by dust and scratches.

Need more advanced tools? Paint Shop Pro supports vector objects. Many image editors now include vector tools, which create objects with crisp edges, such as text outlines. Unlike the rest of the pack, Paint Shop Pro integrates its vector tools seamlessly and elegantly—they're super-easy to use, and they mix and match smoothly with the bitmap tools.

It's easy to add special effects with the Effects preview browser. You can fiddle with Paint Shop Pro's 80 or so filters, such as Spiky Halo or Buttonize, and look at the effects without making a commitment. Plus, the program ships with almost every imaginable color-correction tool, including a sophisticated channel mixer, which enhances the red, green, or blue channels in an image by adding percentages of the other two channels.



Jasc Paint Shop Pro 7

To help Web artists create animated GIFs, Jasc includes Animation Shop 3, a midrange Web-graphics creator. Paint Shop Pro itself supports a variety of tools that optimize compressed graphics files for the Web, including JPG, GIF, and PNG. In addition, Paint Shop Pro includes all the buzzword Web features, including slicing, rollovers, and image maps, though these features can be hard to locate.

Paint Shop Pro fails in one critical area: print proofing. It doesn't include a preview function and can't use standard ICM color-matching profiles. You'll have to resort to trial and error to guarantee uniform colors from one device to another.

The ICM shortcoming aside, Jasc Paint Shop Pro 7 is a good choice for both novice and intermediate users.

MICROSOFT PICTURE IT PUBLISHING PLATINUM 2002

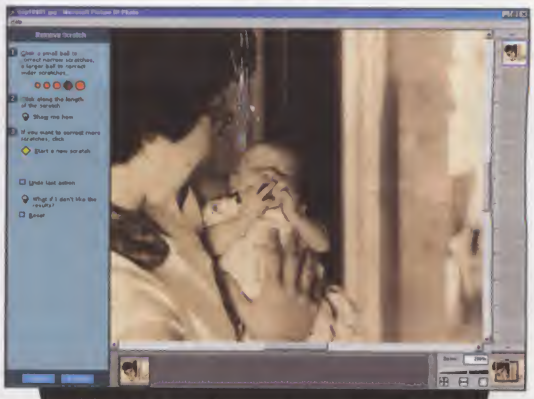
EDITORS' RATING 8.8

PROS: Oodles of tools for editing, special effects; easy to use; inexpensive
CONS: Intrusive promotional material

Microsoft's easy-to-use Picture It Publishing Platinum 2002 packs a variety of useful editing tools and tops it all off with a sterling help system that includes both animation and a manual. Picture It is a top choice for both novices and more ambitious experimenters, and it costs only $54.95.

To begin a project, select from a variety of templates, such as calendars, business cards, stickers, brochures, albums, or envelopes. Alternately, you can open and edit a digital image by accessing files from your hard drive or acquiring new images from your scanner, camera, or MSN Photos online photo album.

Once you've chosen the image, Picture It brings you to the main workspace. Thumbnails on the right side of the screen let you access different layers of your project. Below the main window, you'll find thumbnails of the images you've worked on recently, along with a slide bar to let you adjust the image size of your current project. On the left sits the tool panel, which offers either a clickable list of options (for tweaking size, color, depth, and more) or step-by-step instructions on how to use each instrument.



Microsoft Picture It Publishing Platinum 2002

The program offers a remarkable number of editing tools. It's easy to adjust brightness, tint, and size, and to correct red-eye: All you do is choose the appropriate tool and click the image. If you wish, you can add several artistic special effects. These "Illusions" can re-create your photo as a charcoal or pencil sketch. Other special effects let you add a 3D look, distort the image by pulling it out of shape, or fill areas with a variety of colors and brush strokes. Picture It also lets you add virtual picture frames, mattes, and backgrounds, or you can choose from a large store of categorized clip art and templates that include images of animals, clothing, and cartoons. When you're finished, organize your images in Picture It's gallery, where you can categorize them, name them, and add keywords.

Picture It includes tools to remove scratches and dust, and to restore the focus and contrast of old photographs. Once you complete a project, you can export it in several different formats and store up to 30MB of images in your own Web album at MSN Photos for free. You can order Fuji prints of your photos, starting at 49 cents per 4-by-6-inch print, directly from the site.

Our only major complaint about the program is that Microsoft sticks in occasional intrusive self-promotional ads. Nonetheless, you'll find Picture It Publishing Platinum 2002 a comprehensive and useful product for tweaking, organizing, and publishing your photography collection. The low price makes it doubly appealing.

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IMAGE-EDITING SOFTWARE

Image Master

For professional-grade photo editing, you'll need more sophisticated tools. In this realm you have an excellent choice: Adobe Systems' venerable Photoshop.

If your requirements run to printing four-color jobs and designing intricate Web graphics, Photoshop 6 ($609 direct, ***www.adobe.com***) has everything you need.

The program's most appealing features are its powerful color-correction tools, Web-graphics output, and automation. Creative types will appreciate the sensitive brushes and the wealth of filter effects. The powerful selection capability includes a remarkable Extract command for creating masks of difficult objects such as wispy hair. You can organize documents using up to 8,000 layers that can be grouped and reordered.

Photoshop also supports adjustment layers. These layers provide color control, such as hue/saturation and color balance, and are a flexible way to preview color-modification effects because layer visibility can be toggled on and off. Layers can also have styles such as drop shadows and glows attached to them—nice for special effects. And if that isn't enough, each layer can have its own mask so you could, for example, hide Uncle Bobby in the wedding photograph without permanently cutting him out of the picture.

Best of all, Photoshop is extensible. If the core program lacks the right tool, chances are someone's developed a plug-in. Literally hundreds of these are available, and many are freeware or shareware. If you want the best photo editor money can buy, Adobe Photoshop is it.

—S.G.

ULEAD PHOTOIMPACT 7

EDITORS' RATING 8.8

PROS: Plenty of easy-to-use editing tools; handy batch processor; lets you create Web components; free online storage
CONS: Uninviting interface

cnet Editors' Choice

Ulead Systems' PhotoImpact 7 gives you more than your money's worth. The $99.95 package lets you massage digital images, construct components for Web pages, and generate sophisticated blends of bitmap and art.

PhotoImpact lacks the step-by-step tools and soup-to-nuts templates that programs such as Picture It hand to rookies. Its menus are cluttered with commands, and it spawns many free-floating tool palettes. Even experienced users will need to take time to remember what's where and to select the correct commands.

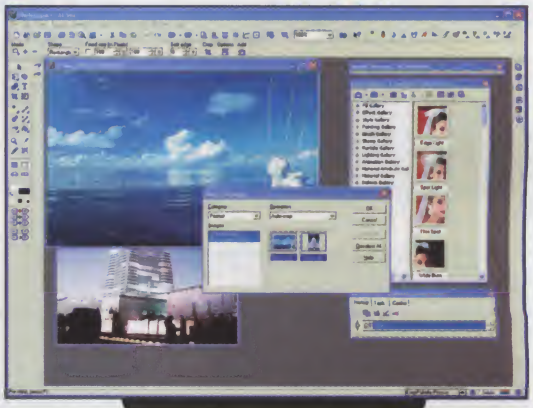
Once you get comfortable with PhotoImpact's interface, it'll be smooth sailing. As with most design tools, the workspace occupies much of your display. Toolbars surround it at the top and on the left, and the tool palettes roll up with a double-click, leaving the workspace uncluttered.

PhotoImpact functions as a digital photo editor, a Web-graphics designer, and a bitmap and object-based drawing tool. A post-processing wizard walks you through all kinds of photo fix-it features, from removing red-eye to adjusting color to cropping. To apply scores of effects, from halo lighting to fun-house-mirror distortions, just click the appropriate thumbnails in the EasyPalette panel.

Two new tools in version 7 are true time- and money-savers. The Batch Manager lets you apply the same effects or use the same tool simultaneously on multiple images. The other tool, Print Multiple, delivers a wealth of print options that make it easy to put several shots on one sheet of expensive photo paper.

Like Picture It, PhotoImpact integrates with a free photo-sharing and -storage site. iMira lets you save up to 20MB of pictures, edit them online, organize them into albums, and share them with friends and family.

Web-graphics-creation tools set PhotoImpact apart. These tools make it a breeze to build buttons, bullets, and banners. Want to slash the download time of your Web site? No problem: PhotoImpact's Image Optimizer compresses JPG, GIF, and PNG image files, and shows before-and-after results. The equally handy Background Designer, with 22 groups of textures, lets you create page backgrounds in seconds. Plus, the GIF Animator 5 utility makes short work of assembling small animated images, and the new Image Map tool lets you define clickable hotspots. Our pick of the litter? The new Slice tool, which dices an image into pieces, each of which you can quickly turn into a clickable link.



Ulead PhotoImpact 7

What's more, PhotoImpact's slick integration of both bitmap (raster) and vector tools means that, as with Paint Shop Pro, you can switch from airbrushing pictures to placing a predefined geometric shape without skipping a beat. And PhotoImpact puts tons of image-making tools in your hands; Z-Merge is the coolest, letting even the graphically challenged meld multiple objects into 3D composites.

Ulead PhotoImpact 7 is a steal, an all-in-one graphics package suitable for both amateur artists and cash-strapped professionals. ▼

< PRODUCT SUMMARY >

EDITORS' RATING (Rated 1 to 10)	6.5	7.8	8.8	8.8
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PC TELEPHONY

Calling All PCs

Making calls on your PC can offer significant savings over traditional phone calls, but it requires some trade-offs.

by Jon Halpin

Just as letter-writing fell prey to the convenience of the telephone, text sent over the Internet is now in jeopardy of being supplanted by the sound of the human voice. The proliferation of e-mail, chat services, and instant messaging returned us to an age of communication via the written—or, more accurately, the typed—word. Now the widespread availability of inexpensive voice-over-IP (VoIP) services can give your fingers a rest and let you really talk online.

Besides providing for more-entertaining online chatter, VoIP services let users place telephone calls from their PCs. Internet telephony services, which send phone calls over public and private data networks, are seeing usage increase as quality control improves and broadband becomes more widely available. The real appeal for consumers, however, is measured in dollars: Net telephony offers savings on long-distance bills that no carrier can match.

WINDOWS XP RAISES ITS VOICE

The release of Windows XP illustrates the rising prospects of voice services. Microsoft ***(www.microsoft.com)*** has partnered in the United States with Net2Phone ***(www.net2phone.com)***, Dialpad Communications ***(www.dialpad.com)***, and Deltathree ***(corp.deltathree.com)*** to handle Internet phone calling.

Version 4.0 of Windows Messenger, which comes bundled in Windows XP, supports text, video, and voice capabilities. Users can initiate voice chats by selecting a name from the contact list of people currently online. And for the first time, users can make an Internet phone call from their PC to their contact's telephone from within the instant-messaging interface.

"Microsoft is now serving as a telephony exchange," says Bryan Wiener, senior vice president and general manager of Net2Phone's communication services division. All calls are handled within the Messenger program; users need only select which provider to use and register for billing. The latest version of Messenger (version 4.6) also works on previous versions of Windows and can be downloaded from Microsoft's site

ILLUSTRATION BY BEK SHAKIROV

(messenger.microsoft.com/download).

Microsoft is not alone in incorporating VoIP capabilities into its instant-messaging program. AOL, Yahoo, and ICQ all have added voice-chat and telephony components, with Net2Phone acting as the back-end telephony provider for all three. In each case, voice chats are free, but PC-to-phone calling costs a couple of cents per minute. AOL Instant Messenger (AIM) users, for example, can use the AIM Talk feature with another AIM user simply by selecting the Talk button within the interface. Using the AOL Phone feature requires an additional software download and registration to set up billing.

It's only recently that Internet calling has cost money. For the last several years, almost all Internet phone services were offered free, with a small charge for international calls. But the economic downturn that burned the dot-com industry also put many Internet telephony companies to the flame. Those left standing are ones with fee-based services, though PC-to-PC calls remain free.

The SyberSay Earlite 542's compact design combines a microphone and speaker in a single-ear headset.

Even with price tags attached, the rates are lower than those offered by nearly all long-distance carriers. Consider that the lowest-cost plans of most major long-distance carriers for domestic calls average 5 cents per minute for nights and weekends, 7 cents per minute for weekdays, plus a flat monthly fee of $10 to $20. The measly 2 to 4 cents per minute charged by Internet telephony providers can offer major savings.

ON THE LINE

Internet telephony services can deliver these savings by sending voice calls over the public Internet and privately managed networks. Doing so bypasses some or even all of the costly switching fees charged by local and long-distance network operators. However, the quality of the call is generally better with a traditional switched connection.

For voice to traverse the Net, it must first be converted from an analog signal to a digital one. That signal is then broken down into envelopes of data called Internet Protocol (IP) packets. Whereas ordinary calls maintain their quality by having a line open throughout the call's duration, voice transmissions over the Internet get jostled by the herd of data flowing through the networks, which typically results in a degradation of quality. Delay of any packet will result in a delay in reassembly, producing time lags and glitches in the midst of conversations. In addition, voice calls sent over the Net can sound fuzzy and unclear, accompanied by distracting sound effects such as speaker feedback and echoing.

Over the last few years, advances in sound-compression technology, network architecture, and speaking/listening devices have yielded moderate improvements in VoIP quality, but no one will mistake an Internet call for a conventional call. Audio quality ranges from good to very poor, depending on connection speed and equipment. And some telephony services, including Net2Phone, further decrease the quality by sending calls over private networks. But even these will have to pass through the public Internet at their origins and destinations.

Despite Net telephony's low quality, its low cost gives it a definite bargain-basement appeal. Dean Barker used PC-to-PC phone services as a cash-strapped graduate student to stay in contact with friends at other schools. Quality wasn't the foremost concern on his mind. "My computer was slow, the connection was slow, and my speakers were crap, so the sound was never that great," he recalls. "But once we got used to the waiting and the low-fi reception, it was worth it not to have the phone bills."

THE PC CONNECTION

Configuring your PC to make calls is simple enough, though it's still more complicated than just picking up the phone. Any of the major IM programs are available for free download and can be set up in a matter of minutes. The software for most Internet telephony services, including Net2Phone and iConnectHere, Deltathree's consumer division, is also available for download. Most of the setup time will be spent registering and providing your billing info.

The Linksys EtherFast Cable/DSL Voice Router enables you to use an ordinary phone with your broadband connection.

Net2Phone's Wiener says the primary users of his company's service are students, small-business travelers who use company phone cards, and people with family overseas. For these groups, the savings add up quick.

Domestic calls placed through Net2Phone are free for the first 5 minutes and 2 cents per minute thereafter. iConnectHere users can either pay 1.9 cents per minute or select the North American plan for $1.99 a month, which allows 400 anytime minutes and 3.9 cents per minute thereafter.

Those making international calls stand to reap the biggest savings, with discounts of up to 90 percent over traditional phone calls. The problem is that country rates vary wildly; a call to Russia may cost 10 cents a minute, while calling Israel could be as much as 50 cents a minute. Likewise, the telephony services offer different prices on the same countries. Consumers who plan to make a lot of international calls should compare the rates offered for the specific countries they'll be calling before selecting a provider.

The hardware required for VoIP is minimal. Most VoIP services recommend a Pentium-level computer with at least a 100MHz processor, 16MB of RAM, Windows 95 or later, a 28.8kbps modem, speakers, a microphone, a full-duplex sound card, and a couple of free megabytes of storage for installing the software.

With such a basic configuration, don't expect much. To improve Internet conversations, you need to have the right ISP, Internet connection, and listening device.

Net2Phone's Wiener says ISPs are the most important factor for successfully using VoIP services. "People who have better ISPs make more phone calls," he says. "If you have an ISP with plenty of bandwidth, you'll have a better experience." Larger, established ISPs generally have brawnier network infrastruc-

LINES OF Communication

Although the Internet service provider you choose will ultimately have the greatest impact on the quality of your Internet calls, many devices are available that let you fine-tune the experience.

Telephone handsets offer telephony users the comfort and familiarity of speaking into a phone. Riparius Ventures' Internet Telephone Handset ***(www.riparius.com)*** sells for $24.95, and promises to eliminate feedback and turnaround delay. The Claritel-i750 USB telephone from Clarisys ***(www.clarisys.net)*** bypasses the PC sound card entirely, so users can listen to MP3s on their speakers while holding a conversation on the handset. With a simple USB interface and a speakerphone mode, the echo-free handset retails for $69.99.

Those who prefer to converse hands-free may want to opt for a headset. Emkay Innovative Products' $19.95 Value Line Headset ***(www.emkayproducts.com)*** is a single-ear headset with a flexible boom microphone. Plantronics' Dot Audio 60 stereo headset ***(www.plantronics.com)*** comes with an adjustable microphone for $29.95, and SyberSay Communications' $59.95 Earlite 542 ***(www.sybersay.com)*** is a good fit for laptop users with its compact earbud design and microphone built into the earpiece.

You can even avoid going the handset/headset route by using a desktop microphone to talk and your PC speakers to hear others. Expect to pay $10 to $15 for a basic desktop microphone to $45 and up for units with noise-canceling circuity and other features.

Video chatters can use a Webcam to liven up their online conversations. The Intel Easy PC Camera ***(www.intel.com/pccamera/easypccamera)*** uses a USB connection and retails for $39.99. Logitech's $79.95 QuickCam Web ***(www.logitech.com)*** also connects by a USB port. It can capture still shots and short video clips.

If you're really serious about Internet telephony, you may want to consider the Linksys EtherFast Cable/DSL Voice Router for use with Net2Phone ***(www.net2phone.com/broadband/products.html)***. The router connects a normal phone to broadband for Internet calling, and costs $179.99 plus the cost of a calling plan. The V2Phone from iConnectHere ***(www.iconnecthere.com)*** works in a similar vein, and is available for $69.99 plus calling plan.

tures and are better equipped to handle VoIP.

Industry observers agree. "PC-to-phone conversations over dial-up can be very irritating," says Elka Popova, program leader for next-generation packet voice services at the technology consulting firm Frost & Sullivan. "The experience varies a lot, depending on the Internet service provider."

Bandwidth is another important ingredient. Cable and DSL users can expect artifact-free conversations with no lag. Users of 56kbps analog modems, supported by a good ISP, may have to adjust to some sonic fuzziness and lag, but should still be able to talk clearly. Users with slower connections or connecting via small or offshore ISPs will face problems of more ambient sounds and serious lag. In a nutshell, the broader the pipeline, the better the call quality.

The Dot Audio 60 headset from Plantronics includes a noise-canceling microphone.

Wiener says many common microphone/speaker combinations also increase distortion. Speaker echoes can muddle sound quality as surely as a slow connection. He strongly recommends headsets (which cost $15 and up) to eliminate the echo effects.

Broadband users can even opt to bypass their PCs altogether. Net2Phone and iConnectHere both offer devices that use DSL or cable connections to create a virtual second phone line independent of the PC. iConnectHere's V2Phone and Net2Phone's VoiceLine service using the Linksys EtherFast Cable/DSL Voice Router link an ordinary phone to the broadband connection. Consumers can then pick up, dial, and make calls with the Net phone like any other phone, except that the calls travel over the Internet.

The pricing for these phones is similar to PC-based telephony. Purchasing the router though Net2Phone is $179.99, and calling plans range from $9.99 a month for 250 minutes (4 cents a minute) to $49.99 a month (2.9 cents a minute) for 1,700 minutes. iConnectHere's V2Phone service costs $69.99 for the device and $19.95 a month for the service, which allots you 240 minutes (with extra minutes at 4 cents per minute); an optional 3,000 minutes a month is $20.

Internet telephony providers also offer phone cards with per-minute rates higher than those offered for PC-phone calling, but still cheaper than traditional calling cards.

MAKE THE CALL

Voice chat and PC-to-PC calling are fun ways to idle the time and talk to people for free. But as a replacement for phone use, they present some problems. First, both are inconvenient. Talking to someone requires scheduling a time to call in advance or a simple hope that your friend will be online at the same time as you. Plus, you have go through the process of booting up the PC and logging on to contact someone. PC-to-phone calling removes the scheduling aspect, but retains the inconvenience of tying the caller to the PC.

Still, Internet telephony can save you some money when compared with traditional phone calls. For international calls, the savings are impressive, although phone cards from some long-distance companies offer rates competitive with those offered by Internet telephony services.

But the savings may not be enough to attract a lot of users. "Voice communication services in the U.S. are extremely competitive and pretty affordable," says Frost & Sullivan analyst Popova. "How much of a difference does it make to your monthly budget? Not much. So why buy the headset, download the software, and put up with the poor quality?"

Clearly, Internet telephony won't be replacing local phone service anytime soon, as consumers want to get incoming calls when not manning their computers. They also like having access to emergency services, including 911, which are not yet supported by the online carriers.

In time, though, Internet telephony services and cable companies may rise as actual competitors to the telecom industry. Net2Phone's Wiener sees this as a strong probability for his company. When a cable-modem user dials into PC telephony, he notes, "a cable company will sell you a telephony solution for which Net2Phone will be the underlying provider, competing with local telephone providers." ▼

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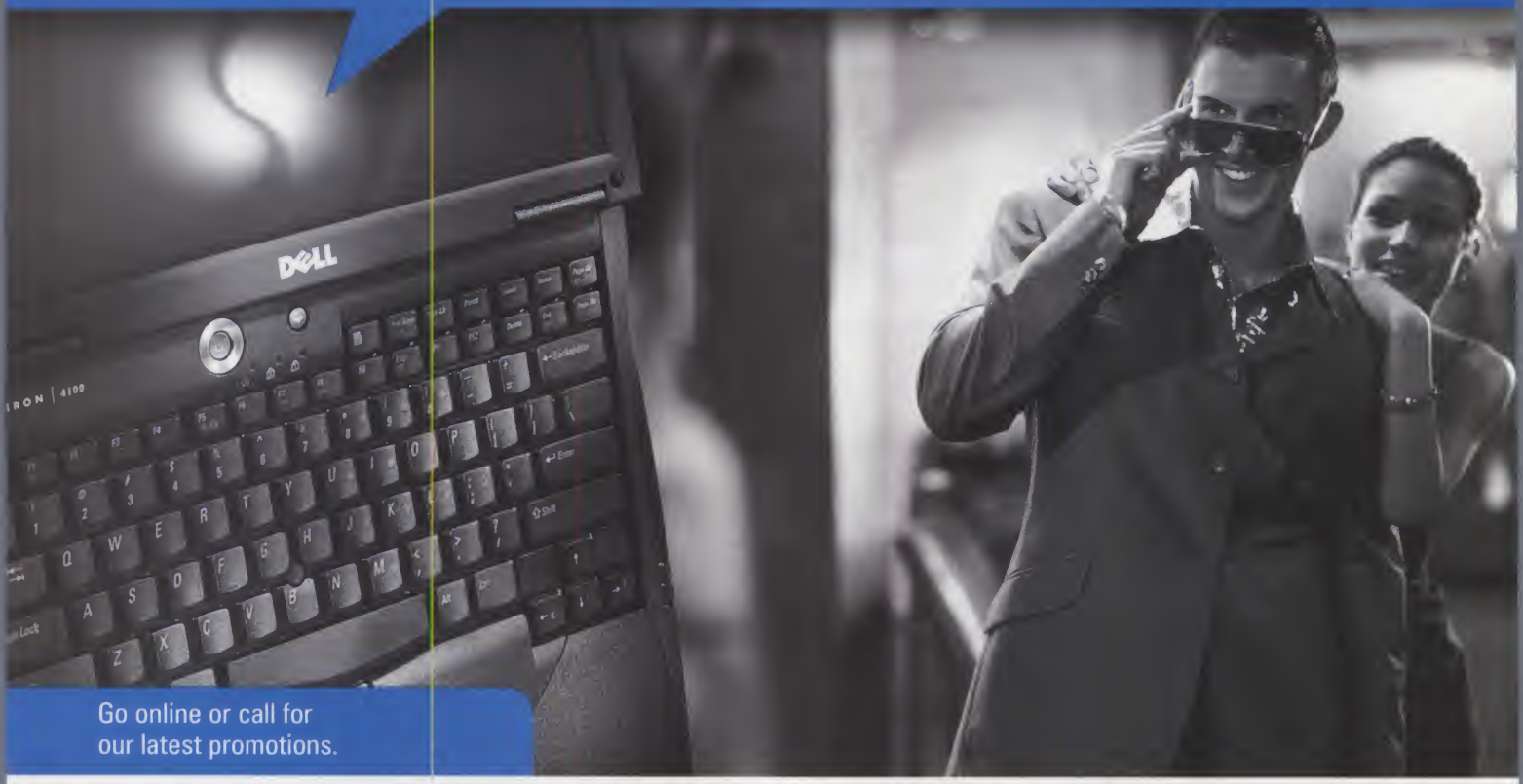

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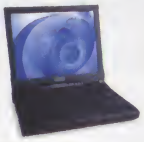

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- 40GB[5] Ultra ATA Hard Drive, add $99

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- 4 Cell Li-Ion Battery
- Integrated 3Com® 10/100 Ethernet LAN; Integrated 56K[6] v.92 Capable Modem
- Windows XP Professional
- 3-Yr Limited Warranty[2]; 3-Yr Next Business Day On-Site Service[4]

$1999 or as low as **$60**/mo for 45 mos.[12] No payments for 90 days for qualified customers.
E-VALUE Code: 00827-800319L

Recommended upgrades:

- 256MB SDRAM, add $99
- 20GB[5] Ultra ATA Hard Drive, add $79
- External 8x Max DVD-ROM Drive, add $169

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WEB CONFERENCING

virtual meeting places

These six Web-conferencing services represent the next best thing to being there.

by RICHARD SANTALESA

Despite impressive improvements over the past four years, Web conferencing remains the Rodney Dangerfield of computing—it don't get no respect. In the wake of last September's terrorist attacks, however, flight cancellations, long airport delays, and heightened anxiety levels have made it more appealing.

In fact, remote conferencing may finally be poised to enter the business mainstream. In a December 2001 report, Wainhouse Research projected the $3.6 billion conferencing-service-providers (CSPs) market would reach $9.8 billion by 2006, while the market for enterprise and personal conferencing would grow from $600 million in 2001 to $1.4 billion by 2006.

Although high-end videoconferencing remains out of reach for most small businesses, Web conferencing presents a less expensive alternative. Web-conferencing services enable you to conduct presentations and meetings over the Internet using nothing more than a browser. You can share documents and present slides in real time, highlight key points with tools that make your mouse operate like a pen or a marker, and get feedback with text chat. Add a microphone, and some services let you speak to attendees using voice over IP or, for a better-quality connection, combine your Web conference with a teleconference.

One of the services we reviewed, WebEx, also offers videoconferencing. For most business meetings, however, this feature is unnecessary. While it does eliminate the "who's talking now" conundrum, the features of many Web-conferencing products adequately address this issue.

In fact, adding video could even detract from the conference. Some participants who are intimidated by face-to-face meetings often communicate more freely in conferences with only audio and text communications. What's more, videoconferencing introduces a whole new set of hardware requirements for participants, unless you limit video capabilities to the presenter. And if you've ever seen what video looks like over the Web, even with a fast connection, you may have already decided it's not worth the effort, frustration, or expense.

We looked at six popular Web-conferencing tools: Centra

PHOTOGRAPH BY CHRIS GOULD

Conference 5.3, eRoom 5.4, Genesys Meeting Center, PlaceWare Conference Center, Raindance Web Conferencing Pro 5.1, and WebEx Meeting Center. All you need to get up and running with these products is an Internet connection, a browser plug-in or Java applet, and a little patience. A broadband connection isn't required, but it's highly recommended.

CENTRA CONFERENCE 5.3

Centra Conference 5.3 ***(www.centra.com)*** is a cost-effective Web-conferencing product for one-way presentations. But it also offers a very limited set of features, so it may not meet the needs of businesses seeking advanced capabilities.

Because Centra integrates full-duplex audio over the Web, it eliminates the need for participants to dial a teleconference number. But it requires that each user have a PC outfitted with an adequate sound card, microphone, and speaker, and getting everything just right requires some technological know-how. The hassles may outweigh the benefits, since voice over IP suffers from latency problems. For one-way communication, this won't be an issue, but if you'd like to offer participants the chance to speak, you may prefer the quality of a plain-old telephone connection.

Centra supports five presenters and up to 1,000 simultaneous participants. It's best suited for one-way presentations because you can display other users' desktops and applications, but you can't share them.

When you log on, Centra loads a 1MB applet, then performs an audio check to test and calibrate your microphone and speakers. The presenter gets full control of the microphone and the presentation, and can "pass" the microphone to a participant. Participants' replies to presenters' yes or no questions appear as green check marks or red Xs. Presenters can also develop polls during the conference, then share the results with participants. The interface is a bit busy, however, and staging an interactive, collaborative meeting can be time-consuming.

Customer service is available toll-free by telephone in several regions of the country, as well as via e-mail. (Tech support answered our query within an hour.) The Help & Support Web page also provides FAQs, a glossary, and user guides. We received prompt and accurate answers through both avenues.

Centra offers a variety of pricing plans. A one-time presentation for 500 participants costs $50 per seat per event (up to 2 hours). If you run frequent conferences, you can choose to pay an annual license fee for unlimited use. Fees range from $350 per seat per year for around 250 seats to an undiscounted, low-volume fee of $1,200 per seat per year.

EROOM 5.4

eRoom ***(www.eroom.com)*** delivers a polished Web interface and a comprehensive list of remote-meeting tools.

Within eRoom, you'll find a trove of useful features such as threaded discussion boards, notes, URL links, polling, drag-and-drop file storage, and databases with indexed information. A mini-portal view offers snapshots of project status, task status, and related project milestones. You can even synchronize calendar items with Microsoft Outlook.

The well-designed navigation helps participants access components with minimal hassle. Various eRoom functions are accessible using the left navigation bar; other buttons help you locate events, team members, and meeting information.

Using eRoom's optional Real-Time Server, team members can collaborate simultaneously with chat, instant messaging, and a whiteboard, which enables file

(continued on page 148)

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24x10x40	IDE	Yamaha CRW3200EZ	$170	$210
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32x10x40	IDE	Pacific Digital Mach 32	$99	$139
32x10x40	*IDE*	GoldStar GCE8320BI	★ $125	N/A
32x10x40	*IDE*	*TDK VeloCD*	$165	$205
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QPS	Que! 24x10x40	2.0 CD-RW	$200
QPS	Que! 32x10x40	2.0 CD-RW	$240
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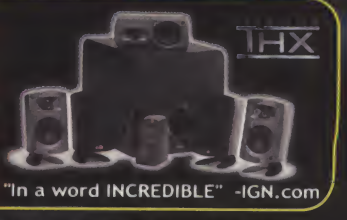

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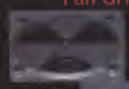

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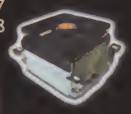

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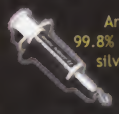

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White, Red

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CDL HDC 1GHZSOHO $699

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ATX PC Cases

Nikao MT2000 300 Watt Silver/Black
$109

Lian-Li PC62 300Watt All Aluminum
$202

Ultimate Black Case w/Side Fan 300watt
$99

ThorTek Black Aluminum P4 300watt
$149

ThorTek SuperMid P4 Black 320watt
$119

ThorTek Silver Aluminum P4/AMD 300watt
$179

ATX Server Cases

Antec SX1240 Full Tower 400watt
$189

Antec SX1040B Performance 400watt
$149

Lian-Li PC70 Full Tower P4 Ready
$349

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ThorTek	5.25" Firewire CD Drive Case	$159
ThorTek	5.25" Firewire Hard Drive Case	$159
ThorTek	3.5" Firewire Hard Drive Case	$95
ThorTek	3.5" USB 2.0 Hard Drive Case	$89
ThorTek	2.5" USB 2.0 Notebook HD Case	$85
ThorTek	2.5" Firewire & USB Combo Case	$109

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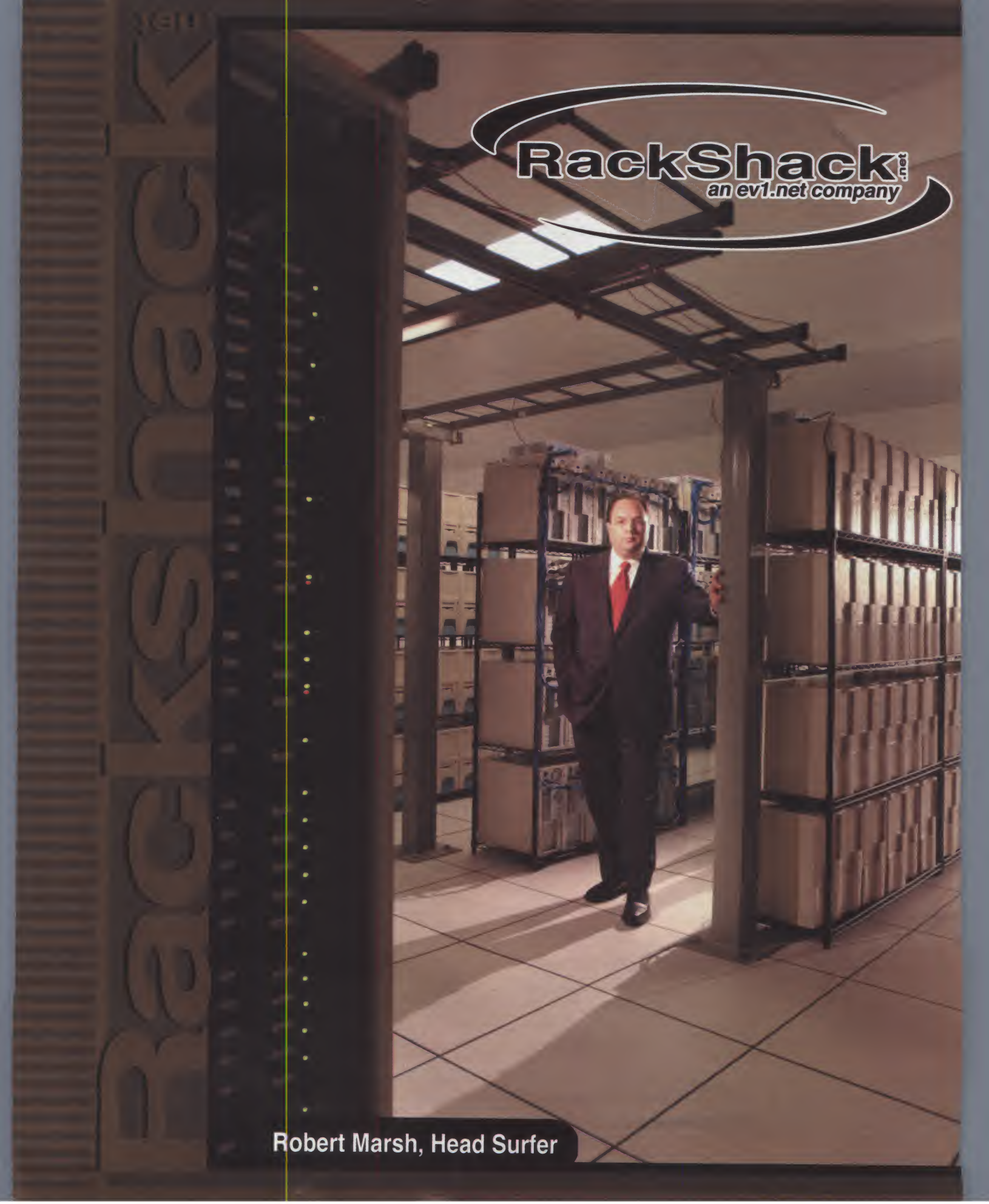
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WEB CONFERENCING

10 Tips for Clever Collaboration

1. Decide in advance who will moderate or "host" the session. This individual has access to special features, such as the ability to mute callers in rooms with distracting background noises.
2. Make sure international callers have a toll number if they can't access domestic toll-free numbers.
3. Determine the length of the conference ahead of time and plan the agenda to fit.
4. Before you start, make sure your computers are compatible with any software necessary for the conference and provide links to instructions in your invitation.
5. Avoid security risks by selecting conferencing vendors that include encryption or other security features.
6. Confirm participants' attendance 24 hours before the session.
7. Be mindful of colleagues' time zones.
8. Keep the conference provider's customer-service number on hand, as well as a list of participants' contact information, including cell-phone and pager numbers.
9. Advise participants in advance whether they need high-speed access for large graphics or streaming content.
10. Take advantage of features such as real-time chat and instant polling to get feedback and keep people involved.

(continued from page 143)

sharing and exchange. Members can work on the same file, for instance, using different colors to annotate text or draw images.

You can let team members with appropriate rights make changes by decentralizing administration. This feature lets users add a participant or create a new eRoom without waiting for IT to make the changes.

Online customer support consists of a searchable knowledge base, installation tips, and support resources. Replies to e-mail queries are promised by the next business day. Two levels of paid support are available for the enterprise version. Maintenance Program, which costs 19 percent of the license fee annually, offers phone support from 9 a.m. to 9 p.m. (ET). Premier Support, at $25,000, is available 24/7.

The product is delivered either through a locally installed server or via the Web. At $150,000 to $300,000, the server version is expensive, but the subscription model is within reach of small businesses at $250 per month per eRoom. An updated version, eRoom 6.0, should be available by the time you read this.

GENESYS MEETING CENTER

Genesys Meeting Center *(www.genesys.com)* supports both one-on-one meetings and collaborative conferences with up to 100 participants. And it's a bargain for small groups.

Meeting Center requires a few extra phone steps to join a meeting. During the demo, we were distracted by a number of users dialing their codes. When participants log on, a 150K Java applet loads into their browsers; presenters require an additional plug-in to share applications.

Emoticons let you raise your hand to indicate yes or no, especially useful for board meetings. In addition, a Chat box puts you in contact with specific participants. (Just highlight the participant's name.) Attendees can manage chat groups, exchange files, copy notes, mute the conference, get help, and leave the conference.

Presenters can create polls and surveys, share applications, and record the conference. Meeting Center supports streaming audio and video, enabling playback of meetings using a basic player such as Windows Media Player.

Customer service is available via a toll-free number and e-mail. (Tech support answered our e-mail query within 1 hour.) Online you'll find FAQs, a glossary, and user guides. Answers were prompt and accurate through both avenues.

For $39.95 per month plus audio charges, you get an unlimited number of meetings with up to 15 participants. (For each additional participant, the cost is 40 cents per minute.)

PLACEWARE CONFERENCE CENTER

A good choice for larger groups is PlaceWare Conference Center *(www.placeware.com)*. PlaceWare offers two types of conferences: Web meetings for smaller groups, and auditoriums for larger groups of up to 2,500.

PlaceWare's interface for participants is simple. To hear the presenter, you call a toll-free number; for an attendee to access additional tools, the presenter must "promote" that participant. Presenters can employ a whiteboard, poll participants, present Web slides and text documents, and share applications and desktops. They can show the attendee what's on their PCs and grant specific participants access to programs running on other machines. Presenters can also hand over control of all or part of their desktops to a participant, regardless of which OS either system is running.

Pricing depends on the type of event, averaging $1,500 per event, plus $50 per seat per hour. (Event recording or registration charges can run an additional $500 to $1,500.) Based on these estimates, a 1-hour conference can cost around $2,000 for 10 participants to more than $50,000 for 1,000 participants. But that's still a bargain compared with the airfare, car-rental, hotel, and food costs associated with bringing all these people together. Small companies that schedule frequent meetings, however, may find a service with a flat rate more economical.

Online support includes FAQs, performance tips, prerecorded tutorials, live daily demos, plug-ins, user guides, and a request form for answers to questions 24/7. (Our question was answered within 2 hours.) Toll-free phone support is available weekdays from 6 a.m. to 9 p.m. (ET).

RAINDANCE WEB CONFERENCING PRO 5.1

Raindance Web Conferencing Pro 5.1 *(www.raindance.com)* also offers two distinct

Web-Conference Comparison

	Centra Conference 5.3	eRoom 5.4	Genesys Meeting Center
Features	Polling; full-duplex audio	Web: discussion boards; URL links; polling; file storage. Server: chat; instant messaging; whiteboarding	Chat; file exchange; mute; polling; application sharing; teleconferencing; conference recording
Best Uses	One-way presentations	Small companies with simple needs, or large organizations that can afford the server-based model	Groups of 15 or fewer
Bottom Line	Full-duplex audio over the Web; flexible pricing; limited features	Good collaboration tools; well-designed navigation; versatile but costly server model	Competitively priced; decent collaboration tools; tricky logon
More Info	*www.centra.com*	*www.eroom.com*	*www.genesys.com*

services. Web Meeting (39 cents per minute) is geared toward small interactive conferences and everyday meetings, and includes such features as built-in phone conferencing, application sharing, interactive Web tours, and audience polling. Web Seminar (49 cents per minute) adds the ability to handle up to 2,500 simultaneous participants.

You must schedule large meetings in advance, but you can set up impromptu gatherings of up to 100 participants. The interface is spartan, with a presentation window in the center and buttons for sharing applications, displaying the whiteboard, and setting up questions and answers. A Web Touring button lets presenters take participants to specific sites. Participants can chat among themselves in a pane on the left. They can also take over all or part of a presenter's desktop (with the presenter's authorization). Presenters must install a plug-in for application sharing and event recording.

Raindance charges by the minute for small Web- and teleconferences (up to about 100 participants). Teleconferences alone cost 27 cents per minute per seat, while live Webcasting costs 21 cents per minute per seat. Larger events carry a $1,000 setup fee, and integrating audio into a Web conference costs an additional 24 cents per minute per seat. A 1-hour meeting for 1,000 participants would cost around $20,000 without phone conferencing, so for large meetings, WebEx's flat rate is more cost-effective. The company recommends you contact a sales representative for exact pricing.

Toll-free phone support is available 24/7. You can also use e-mail; ours was answered within 3 hours. Free customer-training sessions are available on Tuesdays and Thursdays at 1 p.m. (ET).

The Kinko's Connection

Kinko's made a name for itself as a document copier, but since 1993 it has offered around-the-clock, high-quality videoconferencing using Sprint's digital fiber-optic network and VTel equipment. Today, Kinko's has 150 videoconferencing locations in 41 states ***(www.kinkos.com/locations)*** and locations in four other countries (Australia, Canada, the United Kingdom, and the United Arab Emirates).

Participants can share not only full-color presentations, charts, and graphics, but also video. Two-way conferences cost $225 per hour per site, and multipoint conferences cost $265 per hour per site. This includes just about everything: scheduling, room rental, telecommunications charges, live help, and automated billing.

If videoconferencing is a once-in-a-blue-moon affair for your company, Kinko's may be all you need. Just make sure all participants are within easy commuting distance of the nearest location.

WEBEX MEETING CENTER

WebEx Meeting Center is the only product in this review and, according to the company, the only Web-conferencing product on the market that offers real-time data, voice over IP, and videoconferencing. It also serves up an impressive array of collaboration features, including presentation, document, application, and desktop sharing, as well as file transfer, which lets you upload and download documents as desired.

WebEx is well-suited to both small and large conferences (up to 2,000 simultaneous participants). It requires a small browser plug-in, and supports PowerPoint presentations, whiteboarding, file exchange, and application sharing.

Online tech support in the form of FAQs, e-mail support, and browser diagnostics is available 24 hours a day. Before you get started, you can run a test to make sure your connection supports WebEx. Free training information and live demos are available for presentation developers and new users.

Prices are 45 cents per minute per meeting participant, including videoconferencing, or 50 cents per minute per meeting participant with phone conferencing. Or you can pay a flat rate of $100 per port per month for unlimited meetings and concurrent users. These customized meetings include videoconferencing and corporate branding.

IT'S YOUR CALL

To determine which of the products we looked at is right for your organization, ask yourself these questions.

First, who will use the system? If the answer is a small, tech-savvy department, you can handle a more complex product if it has other payoffs, such as additional features or a lower price.

Next, what's the average conference size and the peak number of simultaneous participants? If the numbers are small, find a solution that's optimized for smaller groups. If you run only a couple of meetings a year, you may want to consider a product that doesn't require a subscription or perhaps an outsourcing solution such as Kinko's videoconferencing service. (See the sidebar, "The Kinko's Connection.")

Finally, when planning your conference, make sure you designate a host to corral the proceedings. Even Web conferences demand dedicated planning beforehand and active management while under way. Experienced conference managers can quickly gauge a conference's progress and react accordingly. ▼

PlaceWare Conference Center	Raindance Web Conferencing Pro 5.1	WebEx Meeting Center
Application and desktop sharing; teleconferencing; whiteboarding; polling	Application sharing; interactive Web tours; teleconferencing; polling	Video; voice over IP; application, document, presentation, and desktop sharing; whiteboarding; file sharing; file exchange; PowerPoint support
Larger groups of up to 2,500	Separate services for large and small groups	All groups, large and small
Expensive; great for large organizations	Competitive pricing for small meetings; can host groups as large as 2,500	Powerful presentation and collaboration tools; flexible pricing plans
www.placeware.com	***www.raindance.com***	***www.webex.com***

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EasyDisk

PORTABLE FLASH MEMORY DRIVES

ED1016	16MB USB Drive	$35
ED1032	32MB USB Drive	$49
ED1064	64MB USB Drive	$79
ED1128	128MB USB Drive	$129
ED1256	256MB USB Drive	$269

iomega DataSafe

31902 320GB NAS $3265

ULTRA ATA HARD DRIVES

Capacity	Buffer	Speed	Part Number	
		Seagate		
40.0GB	2MB	7200	ST340016A	$95
60.0GB	2MB	7200	ST360021A	$127
80.0GB	2MB	7200	ST380021A	$168
		IBM		
40.0GB	2MB	7200	07N6654	$98
40.0GB	2MB	7200	07N8020	$103
60.0GB	2MB	7200	07N6655	$120
80.0GB	2MB	7200	07N8084	$172
120.0GB	2MB	7200	07N8086	$289
		Maxtor		
20.0GB	2MB	7200	6L020J1	$79
40.0GB	2MB	5400	4D040H2	$85
40.0GB	2MB	7200	6L040J2	$95
60.0GB	2MB	5400	4D060H3	$110
60.0GB	2MB	7200	6L060J3	$125
80.0GB	2MB	5400	4D080H4	$152
80.0GB	2MB	7200	6L080J4	$165
120.0GB	2MB	5400	4G120J6	$223
160.0GB	2MB	5400	4G160J8	$275
		Western Digital		
20.0GB	2MB	5400	WD200EB	$72
20.0GB	2MB	7200	WD200BB	$79
40.0GB	2MB	5400	WD400EB	$85
40.0GB	2MB	7200	WD400BB	$98
60.0GB	2MB	5400	WD600AB	$105
60.0GB	2MB	7200	WD600BB	$125
80.0GB	2MB	7200	WD800BB	$165
100.0GB	8MB	7200	WD1000BB8	$232
120.0GB	2MB	7200	WD1200BB	$255
120.0GB	8MB	7200	WD1200JB	$275

ULTRA/160 SCSI HARD DRIVES

Seagate

Seagate drives feature the industry's most complete protection solution for data.

Capacity	Buffer	Speed	Part Number	Int.	Ext.
		Narrow SCSI			
18.4GB	2MB	7200	ST318418N	$189	$319
36.9GB	2MB	7200	ST336918N	$279	$409
		Ultra 160 SCSI			
18.4GB	2MB	7200	ST318438LW	$179	$309
18.4GB	4MB	10,000	ST318406LW	$199	$329
18.4GB	4MB	15,000	ST318432LW	$349	$479
36.7GB	2MB	7200	ST336938LW	$279	$409
36.7GB	4MB	10,000	ST336706LW	$359	$489
36.7GB	4MB	15,000	ST336732LW	$565	$695
73.4GB	4MB	10,000	ST373405LW	$779	$909
181.6GB	16MB	7200	ST1181677LWV	$1439	$1569

Maxtor

		Ultra 160 SCSI			
18.4GB	8MB	10,000	KW018L2	$195	$325
36.7GB	8MB	10,000	KW036L4	$385	$515
73.4GB	8MB	10,000	KW073L8	$755	$885

IBM

		Ultra 160 SCSI			
9.1GB	4MB	10,000	07N6360	$185	$315
18.3GB	4MB	10,000	07N6350	$225	$355
36.7GB	4MB	10,000	07N6340	$420	$550
73.4GB	4MB	10,000	07N6300	$789	$919
18.3GB	4MB	15,000	07N4900	$325	$459
36.7GB	4MB	15,000	07N4901	$535	$665

CD-ROM & CDRW DRIVES

▪ SCSI CD ROM Drives ▪

Brand	Model	Max Spin	Speed	Internal	External
Teac	CD532S	32X	85ms	$72	$132
NEC	CDR3010	40X	85ms	$67	$127
Plextor	PX40TS(tray)	40X	85ms	$87	$147

▪ WIDE SCSI CD ROM Drives ▪

Plextor	PX40TSUW	40X	85ms	$99	$189

▪ Atapi CD ROM Drives (IDE) ▪

					Parallel Port
Teac	CD540E	40X	85ms	$43	$98
Mitsumi	CRMCFX48X	48X	65ms	$39	$95
Creative	SBCD52	52X	100ms	$37	$95
Sony	CDU5211	52X	85ms	$39	$95
Acer	CD656A	56X	85ms	$39	$95

▪ CD ROM Towers ▪

Above drives configured in multiple drive towers. For fast access to multiple CD's at one time. Perfect for schools, networks, and more.

We have towers from 2 drives to 14 drives and up to 52X. Call us for custom configurations - including CD Rewriters!

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40x drive speed, 8 drive tower.	MIT40X8N	$1369
48x drive speed, 8 drive tower.	MIT48X8N	$1399

▪ IDE CD Rewriters ▪

(Int. / incl. software, 1R & 1RW disk)

Teac 24x10x40 IDE	CDW524EKIT	$129
Acer 24x10x40 IDE	CRW2410A	$109
Sony 24x10x40 IDE	CRX175A/C1	$129
Asus 24x10x40 IDE	CRW-2410S	$129
Yamaha 24x10x40 IDE	CRW3200EZ	$175
TDK 24x10x40 IDE	A1-241040	$145
Plextor 24x10x40 IDE	PXW2410TAR	$175
Plextor 40x12x48 IDE	PXW4012TASW	$185

▪ SCSI CD Rewriters ▪

Plextor 12x10x32 SCSI Int/Ext Bare	PXW1210TSB/X	$119/ $259
Yamaha 20x10x40 SCSI Int/Ext Bare	YCRW2200S/X	$225/ $285

▪ USB and 1394 CD Rewriters ▪

Yamaha 20x10x40 USB 2.0	CRW2200UXZ	$265
Teac 4x4x6 USB	CDW54EUSB	$165
Plextor 8x8x24 USB	PXS88TU/SW	$245
Sony 16x10x40 1394	CRX1650L/A2	$215
FireWire 16x10x40 (w/ Plextor Drive)	FW16X10X40P	$259
Yamaha 20x10x40 1394	CRW2200FXZ	$299
TDK 16x10x40 1394	FE-161040BX	$279

RECORDABLE MEDIA

▪ CD RECORDABLE MEDIA ▪

CDR-74 in jewel case		
16x	Budget 5/20/50/100 pack	$4/$15/$35/$66
16x	Standard 5/20/50/100 pack	$6/$24/$56/$105
12x	Platinum 5/20/50/100 pack	$6/$24/$57/$106
Printable CDR-74 in jewel case		
16x	Budget 5/20/50/100 pack	$4/$15/$35/$66
16x	Standard 5/20/50/100 pack	$7/$26/$62/$115
CDR-80 80 minute media		
24x	Budget 5/20/50/100 pack	$4/$13/$32/$59

▪ CD REWRITABLE MEDIA ▪

CDR-74W in jewel case		
4x	Budget 5/20/50/100 pack	$6/$24/$56/$104
4x	Standard 5/20/50/100 pack	$9/$35/$79/$159
10x	Standard 5/20/50/100 pack	$15/$59/$145/$279

DVD DRIVES

PIONEER **Pioneer leads the way with these hot DVD deals!**

Interface	CD Speed	DVD Speed	Part #	Price
IDE (tray)	40X/80ms	16X,110ms	DVD116	$65
IDE (slot)	40X/80ms	16X,110ms	DVD106	$69
SCSI	40X/90ms	10X,120ms	DVD305	$98

Record your own DVD disks!

DVD Recorder, DVD-R write 1x, DVD-R read 2x, 4MB buffer, includes software and 3 DVD disks	DVRS201	$3995
IDE DVD Recorder, DVD-R write 2X, DVD-R read 4X, 2 MB buffer, includes software & media	DVR-A03	$409

TOSHIBA Precision and Excellence

Interface	CD Speed	DVD Speed	Part #	Price
IDE	48X/95ms	16X/115ms	SDM1612	$65
SCSI	40X/85ms	10X/105ms	SDM1401	$115

Complete DVD Kits

MegaHaus 16X Drive Kit	DVD16KIT	$125
Creative Encore 12X DVD Drive Kit	CLDVD12KIT	$135
Hollywood MPEG-2 Decoder	HOLLYWOOD	$55

USB DRIVES & ACCESSORIES

Floppy Drive	USBFLOPPY	$85
24x10x40 USB 2.0 CDRW for PC/Mac	T241040USB2	$285
2.2GB Orb	ORBUSB	$174
SuperDisk Drive 120MB & Floppy	USBLS120	$145
1394 USB/PCI Board	70HTL00110	$115
USB to SCSI Adapter	USBSCSI	$59

USB 3.5" Hard Drives w/ Case (5400 RPM)

20GB	USB20GB	$175 /	40 GB	USB40GB	$190
60GB	USB60GB	$209 /	80 GB	USB80GB	$269
120GB	USB120GB	$365 /	160 GB	USB160GB	$395

1394/FIREWIRE PRODUCTS

1394 PCI/Mac Board Kit	70HTL13943	$55
1394 PCMCIA CardBus	70HTL00040	$85
1394 ENET/PCI Board	70HTL00090	$87
1394 Hub	70HTL00030	$85
1394 Repeater:	70HTL00020	$45
1394 15 Ft. Cable: 6pin to 4pin	70CAB13943	$15
1394 15 Ft. Cable: 6pin to 6pin	70CAB13942	$15

1394 3.5 Hard Drives w/Case (7200 RPM)

20 GB	FW20GB72	$205 /	40 GB	FW40GB72	$239
60 GB	FW60GB72	$279 /	80 GB	FW80GB72	$329
120 GB	FW120GB72	$449			

1394 3.5 Hard Drives w/Case (5400 RPM)

20 GB	FW20GB54	$189 /	40 GB	FW40GB54	$225
60 GB	FW60GB54	$259 /	80 GB	FW80GB54	$309
120 GB	FW120GB54	$385 /	160 GB	FW160GB54	$445

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COMPLETE KIT		PLATINUM	BLACK
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IDE 66 with plastic cartridge	DP2200A66	$79	N/A
IDE 66 with metal cartridge	DP2200AM66	$87	$96
ULTRA WIDE SCSI	DP2200UW	$105	N/A

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Internal IDE, with 1 tape	STT28000A	$185
Internal SCSI, w/ 1 tape	STT28000N	$209
External SCSI, w/ 1 tape	STT28000NX	$269
Internal SCSI - RCVT w/Software	STT28000NC	$345
External SCSI - RCVT w/Software	STT28000NCX	$405
Internal IDE, with 1 tape	STT220000A	$265
Internal SCSI - RCVT w/Software	STT220000N	$445
External SCSI - RCVT w/Software	STT220000NX	$505

▪ 4mm DAT Drives ▪

(Native/Comp.)		Max Speed	Brand & Model Number	
4GB	8GB	66MB/min	Seagate DDS-2 STD28000RFT	$635
12GB	24GB	144MB/min	Sony DDS-3 SDT9000AI	$559
12GB	24GB	120MB/min	HP DDS-3 C1554AI	$695
20GB	40GB	288MB/min	Sony DDS-4 SDT11000AI	$819
72GB	144GB	120MB/min	HP C5648A 6 tape loader	$1649
160GB	320GB	840MB/min	Sony TSL-S11000 tape loader	$2745

▪ 4mm DAT Media ▪

DAT120M	Media 1-4/5-9/10+	120 Meter	$10/ $9/ $8
DAT125M	Media 1-4/5-9/10+	125 Meter	$20/ $19/ $18
DAT150M	Media 1-4/5-9/10+	150 Meter	$33 /$32/ $31

▪ QUANTUM DLT Drives ▪

40GB-80GB	6MB/sec (comp)	BH1AA-YF	$1159
Above as ext. our case		BH1AA-YFX	$1289
Above as ext. Qtm case		BH1BA-YF	$1419
40GB-80GB	12MB/sec (comp)	DLT8000	$2235
Above as ext. our case		DLT8000X	$2365
Above as ext. Qtm case		DLT8000QX	$2449

▪ DLT Media ▪

	Media 2-4/5-9/10+	DLT3	$34/ $33/ $32
DLT3XT	Media 2-4/5-9/10+	DLT3XT	$37/ $36/ $35
DLT4	Media 2-4/5-9/10+	DLT4	$73/ $70/ $67
DLTCLEAN	2-4/5-9/10+	Cleaning Tape	$39/ $37/ $35

▪ USB ▪

4GB	8GB	120MB/min	Seagate STT681U-R	$295
10GB	20GB	120MB/min	Seagate STT6201U-R	$335

▪ Backup Software as low as $29 ▪

COLOR PRINTERS

Color Your World

Canon	BubbleJet S200	6862A001	$77
Canon	BubbleJet S300	6649A001	$95
HP	DeskJet 845C	C8934A	$102
Canon	BubbleJet S500	6861A001	$145
Epson	StylusPhoto 785EPX	C408011	$199
HP	DeskJet 690C	C8932A	$197
Epson	StylusPhoto 890	C394011	$299

PDA

HandSpring	Visor Deluxe (Ice)	1002E	$129
HandSpring	Visor Neo (Smoke)	1022NA	$199
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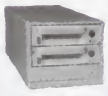

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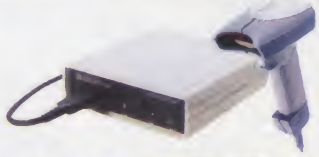

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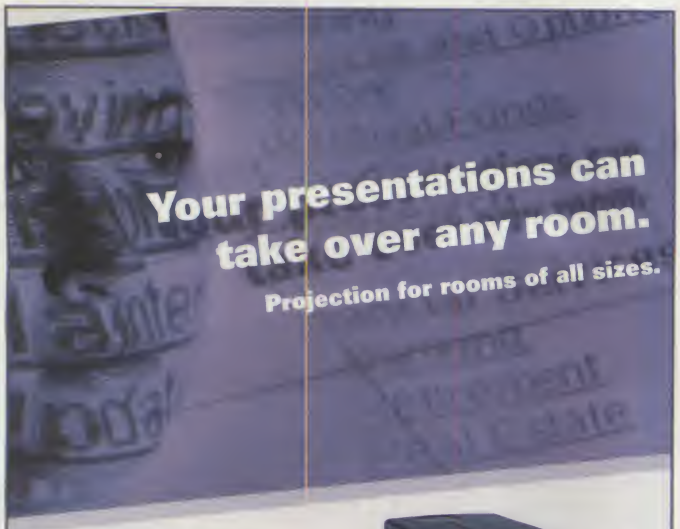

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ALICE & BILL

The Hard Edge

BY ALICE HILL AND BILL O'BRIEN

Here Come the Dot-Com-Backs; Why Monthly Services Are Killing Alice; Celebrating the Foolish; and Intel's Stunning New Pentium 4

ONCE UPON A TIME, WHEN HOME ENTERTAINMENT WAS LARGELY free, people had monthly phone bills as their main, if not only, communications expenditure. Then they began adding cable to their TV sets and received a monthly cable bill. Sure, that meant another check to write each month, but it was a small sacrifice in the name of enhanced communications.

Today, Alice literally had to stop and brace herself against a building after hearing an ad for satellite radio on her Walkman. Alice had covered satellite radio way back when, but more from a technical angle. Now, in 2002, after so much has changed, her perspective has gone from "Is the audio quality truly stereo?" to "Wonder if their revenue model is viable enough to keep them afloat?" to "Oh no, not another low, low monthly fee!"

Alice remembered someone lecturing her once (could it have been Bill?) about the danger of someday everything in the world coming from one company. But as she stood shaking against a building on a chilly San Francisco morning, the thought of receiving a single monthly bill for all her services had a soothing ring to it.

Consider the following. Alice has a cell phone and a regular telephone (two bills). Her cabin in Sonoma also needed a phone (bill number three). In San Francisco, she has cable and dial-up Internet access (two more bills), and in Sonoma, a satellite dish (one bill). So watching television, checking e-mail, and talking on the phone involves writing more than six checks a month.

As more and more Internet companies begin shifting to a monthly billing model, Alice is wondering how much more the average consumer can take. Sure, the individual amounts may be low (satellite radio is supposed to be $9.99 a month), but when you layer on these different providers to the base number of bills most Americans pay (electricity, gas, sanitation, and so on), and consider that most Americans have at least one credit card, plus some sort of loan payment such as a car or a mortgage, the very thought of another invoice to pay makes adding a new service almost unthinkable.

It doesn't even help when the company that provides more than one service is the same. Alice has AT&T cable, telephone, and wireless service, but she still gets three separate bills with AT&T logos. Instead of an AT&T megacorporation that once a month would hand her a statement that broke out cable, telephone, and cell-phone charges in one place, Alice is forced to write out check after check to different departments in the same company.

This month Alice is ringing a very stern "Hard Edge" warning bell on the monthly-service model. Yes, prices have come down, or services have gone up in quality (digital cable involved a nominal increase, but was a leap over basic cable), but people are drowning in bill paying. It's a long and arduous task, even if you sign up for an online bill-paying service (for a monthly fee, of course). Until consolidation happens in the invoice sector, people will start saying "no" to one more monthly payment, no matter how low it is.

'TIS THE SEASON

It's April again. Funny the way that works out. Seems like just last month Alice and Bill were running down the list of foolish things in the world and Shazaam! Here's the month they can devote to it. Rather than bore you with the mundanely foolish (like Fox News hiring Geraldo Rivera), let's talk turkey.

"HARD EDGE" NONLINE

In case you hadn't noticed by now, "The Hard Edge" is no longer online. Don't blame Alice and Bill. It was one of those "Powers That Be" decisions. It seems despite having a huge print readership, very few of you (less than 700 by one *Shopper* count during one particular month) were actually reading the column online. All right, stop mewling about how difficult they'd made it to first find the magazine and then find the column. It wasn't just obfuscation, and, based on the stats, it really was a sound business decision to yank it.

The foolish part is that Bill thinks he has a reason for why things were like that. According to Bill, unless a "Hard Edge" reader had a portable with wireless-Internet capabilities, it was just too much trouble to read "The Hard Edge" online while sitting in the can. Considering how expensive wireless-Internet-enabled portables are, the only logical alternative was to carry the magazine in. That also accounts for the high print readership, especially in places where exotic cuisines are common.

More foolish still, however, is the collateral damage that occurred from yanking "The Hard Edge." It doesn't exist anywhere online. Not just the current column—there are no longer any archived columns, either. This fact troubles Bill the most, and not just because it was "The Hard Edge." It points to a very bothersome characteristic of the Internet.

More and more, we use the Web as a reference source as we rely less and less on paper sources. In a blink of an eye, however, all that online reference material can be

ILLUSTRATION BY TIM COOK

yanked, trashed, and never heard from again. It's history in the unmaking. Worse still, it doesn't need to be the result of something intentional. And when it's gone, when the libraries have long ago closed and the books are filled with crumbling paper, where do we go for a sense of history? Or even for the recipe for lasagna?

To borrow an expression from Alice, it's a bone-chilling possibility that we should all keep in our minds as we push the edges of technology forward.

UNPLUGGED

It's been a long time since portable computers haven't had batteries and weren't small enough to be carried around without the pickup-truck option. Folks are enthralled with them, especially IT folks. No matter how much additional they may pay for a portable over its equivalent desktop model, no matter how much extra they spend on port replicators, keyboards, and the like, one portable computer with all of its accoutrements is still less expensive than two desktop systems or a desktop and a portable combined. That's the smart reason to substitute a portable for a desktop system. But there are also a few foolish reasons.

Battery life has always been an item subject to bragging rights. We're not awash in electric cars yet, so it's a safe assumption that technology is producing batteries at the peak of their efficiency now and for probably the near future. If you can't raise the bridge any higher, the only alternative is to lower the water, and that's just what the two main players, AMD and Intel, have done. They've lowered a processor's demand for power. The scheme used by each is deceptively similar but quite distinct.

Straight from the AMD Web site: "The premise behind AMD PowerNow technology is a very simple one: Some applications require less processing power than others. The system can shift through multiple 'gears' or processor states between the minimum and maximum, delivering smooth performance."

As for Intel, it outlines its plan in this manner: "Enhanced Intel SpeedStep Technology allows a processor to automatically switch between two core frequencies based on CPU demand, optimizing battery life and application performance."

To condense it down to a point where the folks in Davis, Calif., can understand it, Intel will go part-throttle or full-throttle, while AMD can ratchet through a variety of intermediate speeds. Based on that, SpeedStep should provide marginally longer battery life for most of the average computing tasks we do. Surprise you with that? It's because an Intel system dealing with an application that doesn't require full CPU power will always drop to its lowest speed (and power usage), while an AMD portable may find a higher speed (and power-usage) level it feels the application should use. For maximum power savings, Intel is the better choice, but AMD gives you the maximum possible speed while using only as little battery power as it needs.

> Alice and Bill would consider paying a monthly fee to never see Boo.com or the Pets.com sock puppet again.

So, those are the decision points, aren't they? No, not really. The average IT task would hardly tax an old 233MHz Pentium II. And the typical IT guy unplugs the portable at work, carries it home, and plugs it in there. The rare exceptions are for airplane flights (portables are still allowed on planes) and during those rare flashes of brilliance at 2 a.m. when you don't want to move the clutter to route the power cord.

Then what? Well, if you believe your humble chroniclers of computing, both battery life and top speed have been more of an issue for media flacks hopping from kiosk to kiosk while tracking down the new and the wonderful and trying to outshine their colleagues with a "my hertz is bigger than yours" attitude. Other than that, any portable in a storm will do the job.

DOT-COM-BACKS

Consider it a minitrend, but Alice is having fun watching the surprise return of failed dot-coms. eToys reappeared during Christmas 2001, Alice's beloved SportBrain showed signs of rising from the dead, and Amazon.com breathed life back into the venerable Egghead.com. More now-defunct destinations are expecting to come back this year, although Alice and Bill would consider paying a monthly fee to never see Boo.com or the Pets.com sock puppet again. Stay tuned next month for more dot-coms they couldn't kill.

MONDO INTEL

Some things just never seem to have any chance of happening. When they do, you have no choice but to rock back on your heels and rub your eyes in astonishment. It's one of these events that's brought Bill to declare that Intel's Northwood Pentium 4 is Mondo Cool in every sense of the word. Even if you hate Intel, and more than a few of you do, you have to admit the speed advantage offered by the smaller die size and the larger cache (and to some extent, the extra 200MHz of clock speed) just blows everything else out of the water. It does. Face it. (Hey, you Doubting Thomases, check out the ABS Digital 1 review in last month's *Shopper*.)

By now, you've probably also seen the Northwood with DDR SDRAM. (Of course you have. You're holding *Shopper* in your hand. Just flip back to the Features section and check out the MicronPC Millennia TS Professional reviewed in "Clash of the CPUs." The system is running a D845BG motherboard powered by Intel's Northwood 2.2GHz chip with DDR SDRAM.) It's been in the works since December.

Normally, that motherboard would have gotten a special mention here, but even when it was new it was old news. Via beat Intel to the punch on that one with the P4X266 motherboard, and then followed it up with a P4X266A version that had higher memory bandwidth, squeezing just a wee bit more speed from the troops.

Still, Intel did finally get it right, and, for that, it deserves some applause. AMD, the ball's in your court now. Astonish us.

WE'RE NO FOOLS

Alice and Bill are just four months away from their 10-year anniversary writing "The Hard Edge." So starting ironing that nice crisp ten-spot you're going to send them, and practice up by dropping them a line to let them know what's on your mind.

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TUNE-UP

CD-RW to the Rescue

BY SHELDON **LEEMON**

Regular backups may be inconvenient, but they can save you lots of aggravation when disaster strikes.

YOU MAY HAVE BOUGHT YOUR CD-R OR CD-RW DRIVE LARGELY TO BURN audio CDs, but your CD burner can come in handy for other uses. Backing up your hard drive probably ranks as the most important of these, though it's not the sexiest. If you doubt the need for backing up your files, ask yourself this question: How would you feel if you lost all your saved e-mail messages, addresses, financial documents, MP3 files, and digital photos? If "more than a little perturbed" is your answer, read on.

Loading a full disk image to a second hard drive can be a great way to perform backups. With removable media such as CD-R or CD-RW, however, you can protect your data from catastrophes such as fire, theft, or even a severe voltage surge. Blank CD-Rs cost around 50 cents a disc, and using compression you can get around 800MB of data on a CD. That makes backing up even tens of gigabytes a reasonable proposition, and writing to CD-R or CD-RW is a great way to perform selective or differential backups.

For backups to be effective, you must make them on a regular basis. The trick is coming up with a backup procedure that's automated enough not to let you forget it and easy enough not to test your patience. In this Tune-Up, we show you how to perform occasional full backups and schedule frequent backups of only the files you've changed.

First, use backup software that makes the process as quick and easy as possible. The program that comes with Windows doesn't support writing to nonformatted blank CDs or saving a large backup on multiple CDs (disc spanning). Several full-featured backup packages are available for a relatively small investment, including NewTech Infosystems' $79.99 Backup Now Deluxe and Stomp's $79 ($69 for the downloaded version) Backup MyPC (formerly Veritas Backup Exec Desktop). We used Backup MyPC, which gives you more options than Windows' backup application, on a system running Windows 98 SE. The steps should be similar with other software.

TUNE-UP

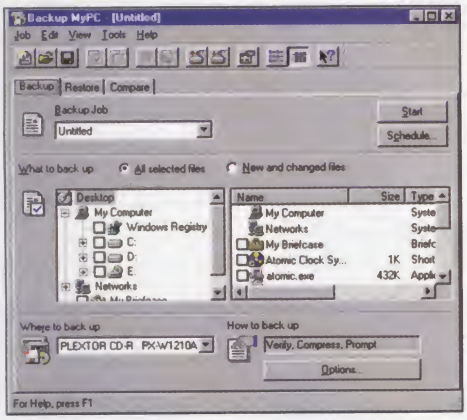
1 CHECK YOUR HARDWARE

If your CD burner's write speed is slower than 4x, an upgrade is well-justified. At best, a 2x burner will fill a 650MB, 74-minute CD in 37 minutes. You may also want to upgrade if you're still using a CD-R-only model. A CD-RW drive lets you use rewritable media, so you can reuse discs for frequent, incremental backups. CD-RW discs typically cost two to three times more than CD-Rs, but you can reuse them as many as 1,000 times.

2 INSTALL THE BACKUP SOFTWARE

Installing your backup software should require little more than inserting the CD and accepting the defaults. The first time you run Backup MyPC, it asks if you'd like to set up automatic data-protection jobs. Click Cancel to move on. Next, the program will ask if you'd like to create a Disaster Recovery Set; click Skip. The startup screen gives you shortcuts to numerous features of the software. Click the Close button to get to the main program.

Backup MyPC recognizes most backup devices automatically. To ensure the software is configured to use your drive once you've made it to the Backup window, check the "Where to back up" field. Your CD-R or CD-RW device should appear in the space provided or, if you have multiple backup devices, as one entry in the drop-down list.



With Backup MyPC, your backup device should appear in the space near the lower left of the Backup window.

3 SET BACKUP OPTIONS

Your backup software should let you specify options for each backup job you create, but it's a good idea to set the software's defaults to suit your needs. In Backup MyPC, check the drive or drives you want backed up. Then click on Options near the bottom right of the main screen and select the appropriate options within the General page. To be sure your backups are accurate, enable the "Compare original and backup..." option at the top of the page. And unless your CPU is ancient, set compression to maximum. Leave the other options alone and click Apply.

Backup MyPC uses these default values as starting points when you define new jobs. It also uses these settings when performing some automated, simplified procedures, such as one-step backups.
Tip: You can speed up backups by excluding large, noncritical files such as MP3s. In Backup MyPC, select Options > Exclude > Add to choose from a list of file types.

4 RUN A FULL BACKUP

Most of us will have at least one occasion to thank ourselves for running full system backups. The strategy we outline here involves monthly full backups followed by daily or weekly interim backups. To get started, you'll need to run one full backup manually.

In Backup MyPC, make sure the drive or drives you want to back up are selected in the main screen's left pane. After you verify you've set Options to the values you want and that the correct backup device is selected, select Job > Save As, and give your job a name, such as "Full." Click Save, and the job name should appear as the backup job on the main screen.

You'll need several discs to complete your backup. To keep the number to a minimum, buy 700MB, 80-minute discs. Using two or three sets of CD-RW discs should save you money in the long run, but sticking with CD-Rs may make sense if you want to hang on to full backups. You can estimate the number of discs you'll need by dividing the number of megabytes you're backing up by 800 (assuming you use compression). To find out how much space you're backing up, right-click on the hard drive icon in My Computer, select Properties, and note the figure shown for "Used space."

To begin the backup, click Start. When asked if you want to move forward with the backup even though multiple discs will be required, answer Yes. The verification stage begins after the full backup is complete; the software will prompt you to insert each disc, and will verify the content of each.
Tip: Make sure no other applications are running when you make a backup, because Backup MyPC can't copy files that are in use. Also, close any programs running in the system tray.

5 SCHEDULE FULL BACKUPS

Now that you have one full backup as a starting point, schedule your monthly full backup. With the name of your full backup job still showing in the Backup Job field, click Schedule. Set the frequency of your full backup job and specify a time. Then click OK and navigate through the confirma-

DVD Dreaming

You can hold 4.7GB of data on DVDs, almost eight times as much as a standard CD. So why back up 10GB of data on 13 or so CDs instead of a couple of DVDs?

One reason is cost. DVD recorders still sell for about $500, and the blanks range from about $5 for a single-use disc to more than $10 for a rewritable disc.

Another reason is the profusion of DVD-recording standards. The first affordable drive for writing DVD-Video discs was Pioneer's DVR-A03, which conforms to the DVD-RW standard. This drive writes both single-write DVD-Rs and rewritable DVD-RWs, as well as CD-R and CD-RW media. But it supports only a single writing session.

The strongest competitor to this format is DVD+RW, as represented by Hewlett-Packard's DVD100i. This drive accommodates rewritable DVD+RW discs as well as CD-R and CD-RW discs, but it doesn't write to the less expensive DVD-R discs, though a one-shot DVD+R disc may be on the way. The first recordable-DVD format, DVD-RAM, didn't take off initially because of its 2.6GB storage limit and its cartridge media that didn't fit in standard DVD drives or video players. But the latest models, such as Panasonic's LF-D211V, can write both to 4.7GB dual-sided cartridge media and to the same bare DVD-R discs DVD-RW drives use.

Finally, you need to consider software support. Dedicated backup programs such as Backup MyPC don't yet explicitly support DVD recorders. It's unlikely such software support will be forthcoming until DVD recorders and media become less expensive, and until it becomes clearer which DVD-recording formats are likely to be around a few years from now.

Bountiful **Backup Info**

Numerous sites deliver good advice and tips about backup, including the lighthearted The Tao of Backup *(www.taobackup.com)* and the CNET.com article "The Best Ways to Save Your System" at ***www.cnet.com/software/0-806180-7-2376963.html.*** (CNET Networks is *Computer Shopper's* parent company.) If you don't have time to back up your entire drive or you want to know how to make extra backups of important data, check out ***www.techhowto.com/Tips&Tricks/Backup/Critical.htm.***

For general information about CD-R and CD-RW, a good starting point is Andy McFadden's CD-Recordable FAQ at ***www.cdrfaq.org.*** CD-RW Central *(www.cdrwcentral.com)* is also a good resource. If you're interested in information about using DVD for backup along with a whole lot more about DVD, check out the FAQ at DVD Demystified *(www.dvddemystified.com/dvdfaq.html)*. Finally, for more information than you'll likely ever need about CD-R, CD-RW, and DVD media, visit CD Media World at ***www.cdmediaworld.com.***

tion messages that appear. When asked if you want to exit the program, click No.

Tip: If running a full backup once a month seems like overkill, try scheduling one job two to three months ahead by choosing "Once" as the frequency and then specifying the time and date.

6 DEFINE DIFFERENTIAL BACKUPS

Between your occasional full system backups, keep your backups up to date quickly and easily by targeting only the files that have changed. Performing automatic differential backups even daily is easy and inexpensive with a CD-RW drive. As long as your differential backup fits on one disc, you'll be able to leave a single CD-RW disc in your drive and have software overwrite the backup each day.

To define your differential backup job, select your full backup job as the current job, select "New and changed files," and click Options. If you'll be using CD-RW media, select "Overwrite the media with this backup" on the General page. Then choose the Type tab and ensure the backup type is set to Differential. Click OK to return to the Backup window and choose Job > Save As to give your differential job a name. Save it to your hard drive.

7 SCHEDULE DIFFERENTIAL BACKUPS

Most of us could get by just fine with weekly differential backups, but running them daily will give you additional protection for little effort. And the process should take only a few minutes each day unless you've loaded lots of large files since your last full backup.

To schedule your differential backups within Backup MyPC, make sure your differential job is selected as the current job within the Backup window, then click the Schedule button. Specify the frequency and time of your differential backups, and, when asked, confirm your selections. Exit Backup MyPC.

Tip: When just getting started with your backup regimen, schedule your differential backups during hours you're typically at your PC. This way, you're there to insert a second disc or solve any problems, if necessary.

TUNE-UP

8 PREP YOUR SYSTEM FOR SCHEDULED JOBS

Backup MyPC won't be able to run the jobs you've thoughtfully scheduled if Windows' Advanced Power Management (APM) has spun down your hard drive after a period of inactivity. To check your APM settings, go to Start > Settings > Control Panel > Power Management. Click on the drop-down menu next to "Turn off hard disks," choose Never, and click OK.

< ESSENTIAL CNET DOWNLOADS >

Backup to CD-RW (Made Simple)
Back up your data to a CD-RW, Zip, or hard drive.

CD-R Diagnostic
Check for problems and recover data from CD-R and CD-RW drives.

NTI Backup Now
Back up your hard drive to CD-R or CD-RW.

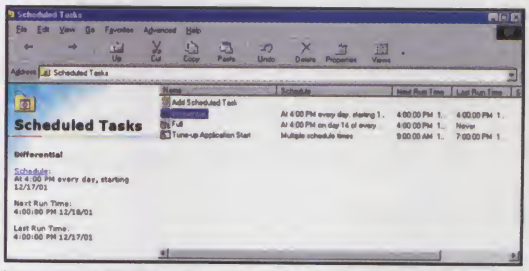
DOWNLOAD THEM NOW FROM ***download.com/shopper***

9 ADAPT BACKUP REGIMEN TO YOUR NEEDS

Chances are you'll need to tweak your backup procedure as you learn what works for you and what doesn't. You may also decide to perform selective backups—backing up only My Documents, for instance—by selecting only certain subdirectories within your backup software.

To edit a backup job once you've created it, choose the job from the drop-down list in the Backup window, make the changes you want, and save the jobs using Job > Save. You can change the job schedule by clicking the Schedule button and entering the appropriate frequency and time.

Tip: You can delete scheduled jobs or modify their schedules using Windows Task Scheduler. It allows more complex schedules than Backup MyPC, including jobs that run once every few months.



You can use Windows Task Scheduler to check the status of scheduled jobs and change their schedules.

10 PICKING UP THE PIECES

If disaster strikes—let's say your hard drive dies—getting up and running again should be relatively easy. After installing and prepping your new hard drive, boot from a Windows startup disk with CD-ROM support enabled (make such a startup disk now if you don't already have one, using Control Panel > Add/Remove Programs > Startup Disk) and reinstall Windows. Then reinstall your backup software and do a full restore using your last full backup and any subsequent differential backups.

Tip: Full-featured backup packages typically offer disaster-recovery backups that streamline this process. In theory, at least, you need only insert the disaster-recovery bootable floppy disk or disc, and the backup software will handle everything else. Creating these backup sets can be more involved, however. They may not support differential backups, and you'll still have to insert your Windows CD when instructed during the restore operation. ▼

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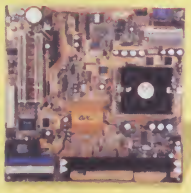
$135.32 Qty.5+
Qty. 1-4 @ $164.28



Motherboard installation required. Shown with optional equipment installed.

Description	Part#	Qty.5+	Qty.1-4
BAT bare-bones pkg with 533MHz CPU	PKG-533B	$135.32	$164.28
ATX bare-bones pkg with 533MHz CPU	PKG-533A	$145.69	$157.67

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24X CD-RW Drive

- Internal IDE/ATAPI interface
- 24X/10X/40X write/rewrite/read speeds

$111.33 Qty.5+
Qty. 1-4 @ $117.14

CDRW-24X40

Description	Interface	Part#	Qty.5+	Qty.1-4
8X /4X /32X drive	IDE CD-RW	CDRW-8X32	$86.27	$92.39
12X/8X/32X drive	IDE CD-RW	CDRW-12X32	$91.42	$96.23
16X/10X/40X drive	IDE CD-RW	CDRW-16X40	$98.61	$103.54
24X/10X/40X drive	IDE CD-RW	CDRW-24X40	$111.33	$117.14
32X/10X/40X drive	IDE CD-RW	CDRW-32X40	$136.43	$145.71
8X/4X/32X drive	SCSI CD-RW	CDRW-8X32S	$161.85	$187.55
16X/10X/40X External drive	USB2.0	CDRW-16X40U	$238.71	$247.55
8X CD-R Media 50-disk spindle		CDR8X-50S	$14.87	$16.22
16X CD-R Media 50-disk spindle		CDR16X-50S	$17.33	$19.14
24X CD-R Media 10-pack		CDR24X-10	$10.90	$11.75
24X CD-R Media 50-disk spindle		CDR24X-10	$24.02	$27.35
4X CD-RW Media 10-pack		CDRW-10	$13.74	$14.54

ATX Case and Power Supply

- Mid-upright ATX PC case
- Pre-installed 230W U/L power supply

$49.73 Qty.5+
Qty. 1-4 @ $66.12

Shown with optional equipment installed.

CASE-ATX230

Description	Part#	Qty.5+	Qty.1-4
BAT Full-upright with 6-bays (No P/S)	EC-632	$9.31	$14.77
BAT Mini-upright with 250W PS	CASE-LT250	$19.45	$23.68
ATX Mid-upright with 230W PS	CASE-ATX230	$49.73	$66.12
ATX P4 Mid-upright with 300W PS	CASE-P4	$71.66	$95.55
200W ATX, UL approved	PS-LC200A	$32.76	$43.29
230W ATX, UL approved	PS-230ATX	$85.24	$89.73
300W ATX, UL approved	PS-300ATX	$102.15	$107.53
300W ATX P4, UL approved	PS-300ATXP4	$103.71	$109.17
400W ATX, UL approved	PS-400ATX	$184.14	$193.83
145W PS/2 type Astec, UL approved	PS-145	$16.64	$18.48
230W PS/2 type, UL approved	PS-230	$75.50	$79.47
Case/PS fan, ball-bearing 3.15" x 3.15" x 1"	FAN-C80	$8.53	$10.46
CPU fan, ball-bearing PGA Socket 7, 370	PGA-FAN-BB	$12.77	$18.32
CPU fan,ball-bearing P4, 423	P4-FAN-BB	$18.52	$26.83
CPU fan, ball-bearing P4, 478	P4O-FAN-BB	$36.77	$38.71

PCI 10/100 Network Card

- 32-bit PCI network interface card
- Supports 10/100BaseT Fast Ethernet

$10.22 Qty.5+
Qty. 1-4 @ $14.17

MCT-P100BT-2

8-Port Switching Hub

- 8-port desktop switching hub
- Provides 10/100 Mbps dual speed support

$48.34 Qty.5+
Qty. 1-4 @ $56.07

HUBS-8

Description	Part#	Qty.5+	Qty.1-4
10/100BaseT PCI card	MCT-P100BT-2	$10.22	$14.17
3Com 10/100BaseT managed PCI card	3C905-TX-M	$42.51	$48.89
8-port 10/100BaseT switching hub	HUBS-8	$48.34	$56.07
16-port 10/100BaseT switching hub	DTS100-16DS	$131.50	$146.12
D-Link 4-port DSL/Cable modem router	DI-704	$79.68	$83.88
UTP Cat-5 solid 1K feet pull-box	UTP10-1K	$57.78	$63.56
UTP Cat-5E solid 1K feet pull-box	UTP35-1K	$81.10	$86.71
UTP Tool kit with NIC cable tester	TK-UTP	$98.35	$108.18

50X CD-ROM Drive

- Internal IDE/ATAPI Interface
- 50X read speeds
- Includes audio cable and mounting hardware

$37.87 Qty.5+
Qty. 1-4 @ $41.15

Description	Interface	Part#	Qty.5+	Qty.1-4
48X CD-ROM drive	IDE	CDROMI-8A	$23.75	$24.88
24X CD-ROM drive	IDE	CDROMI-24	$27.33	$29.12
50X CD-ROM drive	IDE	CDROMI-50	$37.87	$41.15
56X CD-ROM drive	IDE	CDROMI-56	$41.83	$47.91

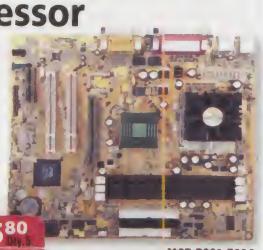
Memory

Description	Part#	Qty.5+	Qty.1-4
128MB DDR PC2100 266MHz	DDR128-2100	$46.14	$48.57
256MB DDR PC2100 266MHz	DDR256-2100	$90.93	$95.71
512MB DDR PC2100 266MHz	DDR512-2100	$196.78	$207.14
64MB SDRAM, 8M x 64, 8ns	D64SD-PC133	$19.27	$20.28
128MB SDRAM, 16M x 64, 8ns	D128SD-PC133	$36.64	$38.57
256MB SDRAM, 32M x 64, 8ns	D256SD-PC133	$70.57	$74.28
512MB SDRAM, 64M x 64, 8ns	D512SD-PC133	$124.86	$131.43
128MB ECC SDRAM, 16M x 72, 8ns	D128SDECPC133	$47.52	$50.02
256MB ECC SDRAM, 32M x 72, 8ns	D256SDECPC133	$94.93	$99.93
128MB ECC registered SDRAM	D128ECCREG133	$61.07	$64.28
256MB ECC registered SDRAM	D256ECCREG133	$101.78	$107.14
32MB 72-pin SIMM, 8M x 32, 60ns	8MX32EDD-60	$25.16	$26.48
64MB 74-pin SIMM, 16M x 32, 60ns	16MX32EDO-60	$33.08	$34.82

Note: Memory prices fluctuate. Please call or go to JDR.COM for current prices.

ATX Motherboard with Intel Processor

- Intel Celeron or Pentium III CPU with ball bearing cooling fan
- VIA Apollo Pro133A chipset supports up to a 133MHz system bus
- Features integrated 3D stereo sound



$116.80 Qty.5+
Qty. 1-4 @ $122.95

MCT-P223-733C

Description	Part#	Qty.5+	Qty.1-4
ATX MB with 733MHz Celeron CPU	MCT-P223-733C	$116.80	$122.95
ATX MB with 850MHz Celeron CPU	MCT-P223-850C	$128.55	$135.32
ATX MB with 1.0GHz Celeron CPU	MCT-P2231000C	$150.17	$158.08
ATX MB with 733MHz PIII CPU	MCT-P323-733B	$187.52	$197.39
ATX MB with 866MHz PIII CPU	MCT-P323-866B	$218.29	$229.78
ATX MB with 1.0GHz PIII CPU	MCT-P3231000B	$224.92	$236.76
ATX MB with 1.4GHz P4 CPU	MCT-P402-1400	$265.68	$279.67
ATX MB with 1.7GHz P4 CPU	MCT-P402-1700	$318.88	$335.67
ATX MB with 1.8GHz P4 CPU	MCT-P402-1800	$347.38	$365.67
ATX MB with 2.0GHz P4 CPU	MCT-P402-2000	$555.12	$584.33

Hard Drives

- IDE DMA/100 transfer rates
- 5,400 RPM spindle speed

$75.36 Qty.5+
Qty. 1-4 @ $79.33

HDD-10

Description	Speed	Part#	Qty.5+	Qty.1-4
10GB Major mfg	5,400 RPM	HDD-10	$75.36	$79.33
20GB Major mfg	5,400 RPM	HDD-20	$80.68	$84.93
20GB Seagate	5,400 RPM	ST-320410A	$88.03	$92.67
20GB Maxtor	5,400 RPM	MAX-2B020H1	$81.62	$85.92
20GB Maxtor	7,200 RPM	MAX-6L020J1	$91.83	$96.67
40GB Major mfg	5,400 RPM	HDD-40	$89.80	$93.68
40GB Seagate	5,400 RPM	ST-340810A	$94.96	$99.98
40GB Maxtor	5,400 RPM	MAX-4D040H2	$94.08	$99.03
40GB Maxtor	7,200 RPM	MAX-6L040J2	$111.47	117.33
60GB Major mfg	5,400 RPM	HDD-60	$112.81	$118.12
Removable drive rack kit		MD-DMA100	$19.23	$22.80
Extra removable drive tray		MD-DMA100TRAY	$12.16	$14.67

Interface Cards

USB PCI Card

- 32-bit dual-port PCI card
- Plug-N-Play connectivity and hot-swappable device support

$14.94 Qty.5+
Qty. 1-4 @ $17.67

MCT-USB

PCI Sound Card

- 32-bit PCI sound card
- Supports 3D positional audio surround sound

$15.96 Qty.5+
Qty. 1-4 @ $17.96

MCT-PSOUND-5

Description	Part#	Qty.5+	Qty.1-4
USB dual-port PCI card	MCT-USB	$14.94	$17.67
USB 2.0 5-port PCI card	MCT-USB2-5	$51.96	$65.13
Sound card, PCI card	MCT-PSOUND-5	$15.96	$17.96
DMA/100 controller, PCI card	MCT-DMA100	$34.39	$39.18
DMA/133 controller, PCI card	MCT-DMA133	$55.97	$58.92
FireWire 4-port PCI card	MCT-FW-3	$37.32	$49.13
ECP/EPP parallel port PCI card	MCT-P1P-E	$22.88	$27.42
VGA with 32MB, 4X AGP card	MCT-AGP4-32	$68.80	$77.40
VGA with 4MB, PCI card	MCT-PV3D-4B	$38.54	$48.86
VGA with 1MB, ISA card	MCT-VGA-1A	$38.54	$48.86
56K V.90 HSP PCI modem	PCI-56K-6	$9.93	$12.91
56K V.90 DSP PCI modem	PCI-56KD-1	$24.56	$27.04
56K V.90 DSP ISA modem	ISA-56K-3	$19.69	$23.02

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ALFRED POOR'S

computer cures

UNDO DAT?

Dear Alfred:

I recently upgraded my system to Windows Me. Now I find there's a hidden file on my hard drive named W9XUNDO.DAT, which takes up more than 165MB. I have no idea where it came from and whether I need it. Can I safely delete it?

Richard D'Amico

The file that you found is just one of a number of files that were created during the installation of Windows Me. It contains the data required to reverse the installation process so that your system could revert to the prior version of Windows. If you're satisfied with Windows Me, you can safely toss out these files.

You could delete these files one by one, but there's an easier way. Choose Start > Settings > Control Panel, then select the Add/Remove Programs applet. Select Delete Windows Millennium Uninstall Information, then click the Add/Remove button. Windows will find all the necessary files and delete them, which should free up a large amount of storage space.

BOTTLE THAT WHINE

Dear Alfred:

When Windows 98 shuts down, I hear a whining sound for about 2 seconds. I have three hard drives in this system, but even with all but the boot drive disconnected, the sound persists. Where is it coming from?

Luther Hill

A hard drive is certainly a possibility, but I have two more likely suspects: your sound system or your monitor.

Let's deal with the obvious one first. Disconnect your speakers, then shut down Windows. If you no longer hear the sound, then it is almost certainly the Windows exit sound. Reconnect your speakers and restart the computer. Choose Start > Settings > Control Panel, and open the Sounds applet. Under the Windows section, scroll down until you find the Exit Windows item. Click on the Play icon located next to the Preview box, and see if it plays the same whine you've been hearing. If it does, simply choose another sound file, or None, for the Exit Windows event.

If you have a CRT monitor and you're still hearing the whine when the speakers are disconnected, try turning off the monitor when the sound starts. If it stops, then you probably have a loose component within the monitor that vibrates audibly under some circumstances. The most common cause is the flyback transformer. In general, this problem is more annoying than anything else, and you can safely ignore it.

> Many people and companies have tons of hardware gathering dust on shelves and in closets, and lots of organizations can put this surplus equipment back to work.

ERASING THE PAST

Dear Alfred:

As the director of a nonprofit agency, I have been fortunate to receive several computers as donations. I can clean these up both inside and out, but when looking in the Registry or the Internet Explorer history list, a few questionable sites have been popping up that are not appropriate for the eyes of the young people in our programs. Can I clean those Web addresses from the system without erasing the entire hard drive and reinstalling all the software?

Donald Cordray

First, thanks to those donors for supporting your programs. Many people and companies have tons of hardware gathering dust on shelves and in closets, and lots of organizations can put this surplus equipment back to work. Check your phone book for local groups or GiveSpot.com ***(www.givespot.com/donate/computers.htm)*** for links to some national organizations. Donating equipment isn't just good for your soul; your pocketbook may benefit at tax time, too.

Now, about your problem. You can clear Internet Explorer's history yourself by choosing Tools > Internet Options. Under the General tab, click the Clear History button. While you're there, delete the temporary Internet files, too. Because these steps may not clear all the drop-down lists and other cached items, shareware and commercial software programs abound that let you wipe the IE history and other cached details. Try Tweak UI from Microsoft ***(www.microsoft.com/ntworkstation/downloads/powertoys/networking/nttweakui.asp)***. This unsupported program has a Paranoia tab that lets you clear many of the traces of past usage quickly and easily.

DISCONCERTING DISCONNECTS

Dear Alfred:

A friend of mine is having problems with her dial-up connection; it seems to randomly drop her connection. Her ISP wasn't able to help, and she hasn't been able to identify any pattern. I suspect that it may be idle time. Do you have any troubleshooting advice?

Jeffrey Kuehn

Some ISPs will disconnect after a certain period of idle time, but I expect your friend's ISP customer support would have brought that up as a possible cause.

My first suspect is line noise. Does she hear crackling on the line when she makes voice phone calls? I don't have any good suggestions for fixing that, except perhaps to contact the phone company.

ALFRED POOR

But because the phone company doesn't have to maintain voice lines for data quality, they may not be willing to help.

The second suspect is call-waiting. Some modems disconnect when they get a call-waiting tone. Disabling this feature (dialing *70 on most phone systems) may solve the problem. You can also install a device that will notify you when you have a call-waiting signal, giving you the choice of breaking your Internet connection to answer the phone, or ignoring the call.

RENAMING NAMES

Dear Alfred:

How can you change the registered name and company in Windows 98 after it has been installed?

Jose Tijerina

That's an excellent question, as I suspect that most systems with preinstalled Windows are still configured as belonging to "Dell Preferred Customer" or something similar. The easiest way to change this is to choose Start > Run, then type **REGEDIT** and click OK. This will run the Windows Registry Editor utility. Choose Edit > Find, type **RegisteredOwner** (all one word), and press Enter. When the utility finds the entry for RegisteredOwner in HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion, press Enter and change the entry to the desired settings. (If the Registry Editor should find a key named RegisteredOwner somewhere else in the Registry, press F3 to continue searching.) The key prior to this one should be RegisteredOrganization. Select that line to change its settings, as well.

Just remember that working with Registry Editor is a bit like walking a tightrope without a net: Any changes you make are immediate, and the utility has no undo feature.

THE WHOS, WHATS, AND WHYS OF WI-FI

Dear Alfred:

If I were to buy a PC with built-in Wi-Fi, does that mean I can hook it up to my home Ethernet network if I buy some kind of Wi-Fi receiver that I connect to my home hub? If so, are these receivers easy to come by and standard?

Glen Pu

Wi-Fi is the user-friendly name for the 802.11b wireless Ethernet standard, a protocol that connects machines to the Internet at speeds up to 11mbps, comparable with wired 10BaseT Ethernet speeds. Wi-Fi can provide a full-speed connection for distances up to 150 feet, though obstructions may reduce this distance. Also, Wi-Fi uses the same standard as Apple's AirPort technology, making it easy to connect PCs and Macs to the same network. You can find out more from the Wireless Ethernet Compatibility Alliance ***(www.wirelessethernet.org)***.

Wi-Fi makes a lot of sense for home networks because you don't have to run pesky wires through floors and walls, which could be inconvenient and expensive. To add Wi-Fi to your existing home Ethernet network, all you need to do is plug a wireless access point into your hub or switch. You can find a wireless access point for less than $200 from companies such as Linksys ***(www.linksys.com)***. ▼

tip of the month

SOUND TROUBLESHOOTING ADVICE

In the early days of the PC, "sound" meant turning a current to the speaker on and off so fast that it produced a tone. Boy, we've come a long way from those scratchy beeps. MP3 and CD audio are commonplace in PC use, and some users have computer speaker systems—including subwoofers—that are better than many stereo entertainment systems.

In recent columns, I've touched on sound problems, which prompted the following tip.

Dear Alfred:

Over the years, I've found that the most common cause of sound not working on my PC was the speaker plug coming out of the sound-card jack. Because the wiring was tight, moving things around caused enough tension to easily disconnect it. Another common source of sudden sound trouble was installing software that messed with my mixer settings.

Neal Fildes

Your point about the speaker plug brings up a basic principle of troubleshooting: When something isn't working right, check the most obvious and basic things first.

Determine whether or not the plugs and connectors are seated correctly, and whether the device is getting power (that is, if it is indeed supposed to receive power). Even if these steps do not solve the problem, they may help narrow down its source. If, for example, you hear a click from the speakers when you plug them in and unplug them, you at least know that they are working on a basic level.

The changes to the mixer settings also point to a larger issue. Some programs make all sorts of changes to the configuration of your system without asking your permission or telling you what changes they've made. I don't have a problem with programmers deciding they know what's best for me, but I do wish they'd be a little more open about what they're doing to my system while they're at it. The only defense I know of is to make a backup—of at least your root directory and Windows folder—before you install a new program or perform a software upgrade.

Send us your favorite tip, and you could receive a tipster's prize package, including a coveted "Computer Cures" T-shirt (one size fits all), plus some other nifty items you can't get anywhere else.

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BUYING ADVISOR

Going Beyond The VCR to a PVR

A personal video recorder puts a busy executive's entertainment center under her command.

BY ALICE HILL

ONE OF THE BEST-KEPT SECRETS in home entertainment is the PVR, or personal video recorder. (The units are also called DVRs, or digital video recorders.) Makers of these wonder devices have tried to show in their commercials the range of PVR benefits, such as pausing live television, watching shows when you want to watch them, and even recording two shows at the same time. Many consumers dismiss the ads with this simple question: Why would I need something like a PVR when I own a VCR?

This was the question Kirsten McKamy asked us when we started advising her on a home-entertainment purchase. She was interested in giving her TV room a boost. We suggested a PVR, believing that no other home-entertainment device would be as versatile or exciting. We explained that a PVR is like an entertainment computer that manages cable channels by organizing the hundreds and thousands of TV shows and movies into a directory she can sort by genre, her favorite director, even alphabetically by title. When a movie title catches her eye, it won't matter that it comes on Bravo at 3 a.m. on a Tuesday three weeks from now. A simple click of the record button schedules the recording, and it shows up on her list of available shows for viewing whenever she likes.

Philips HDR312

THE SEASON PASS

"So I can easily build a library of my favorite movies without hunting through every entry in *TV Guide*?" McKamy asked in disbelief. But that was not all. McKamy admitted that she was addicted to shows such as *Sex and the City* and *The Sopranos*. With a device like **TiVo,** she could set a Season Pass that would automatically record all episodes of her shows even if they switched days or broadcast extra episodes. McKamy admitted that she often forgot to set her VCR on broadcast nights she thought she'd be home, and sometimes ended up missing her favorite shows.

Another great PVR feature turned out to be something that didn't even register with her when she recalled commercials for TiVo and Microsoft's **UltimateTV:** pausing live television. McKamy did note that many times she got an important phone call or left the room during what turned out to be a show's "good part." With a PVR, she could hit pause, leave the room for as long as 30 minutes, and pick up right where she left off. McKamy immediately hit on the PVR viewer's favorite live-TV trick: pausing a show for 20 minutes or so, then using the extra time to whip through commercials as more of the show records up ahead. Sonicblue's **ReplayTV** PVR even comes with a commercial-zapping button that jumps ahead in 30-second increments.

VCRS GET IN ON THE ACT

McKamy had another question for us: What would happen if she recorded a ton of movies and programs and didn't have time to watch them? McKamy liked that PVRs could record to her VCR, enabling her to compile a giant film library without clogging up the PVR's storage space. "I can even back up a full season of *The Sopranos* for my friends who don't have HBO," she pointed out, noting how much easier it is to move a list of prerecorded shows onto one tape instead of setting a VCR for every episode all year.

We showed McKamy similar versions of the three top contenders in the PVR field: UltimateTV, TiVo models from Philips and Sony, and ReplayTV. McKamy agreed with us that the TiVo's user interface was the easiest to navigate, and she liked TiVo's simple wording of things such as "Season Pass" and "Now Showing," the latter for the areas where her recorded shows were kept. UltimateTV and ReplayTV's interfaces seemed more gridlike and cold in contrast. ReplayTV did have a few features she found interesting, such as being able to send a movie to a friend over a broadband connection, but she quickly gave up the idea when she found it could take as long as a day to upload a full-length movie. "What friend would want an attachment that big?" she asked.

In the end, we agreed that Philips' TiVo for cable TV (not the satellite-dish version), with 30 hours of record time, was the best choice for McKamy's budget. At $299, plus $249 for the lifetime directory service, the **Philips HDR312** was certainly at the high end of her spending range, but TiVo often offers $100-off coupons and other incentives that she could find if she shops around. McKamy balked at the $600 price for the 60-hour version, insisting that no one should watch that much television no matter how intelligently it was organized. Then again, she didn't really know what she was in store for! ▼

CHALLENGE

USER PROFILE

Kirsten McKamy, 36, nonprofit-organization associate director, from Westport, Conn.

NEEDS

A better way to watch television without setting a VCR and memorizing TV listings

SOLUTION

THE ADVISOR'S CHOICE

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For other PC100/133 memory visit: www.uupgrade.com/mstandard

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256MB	90.00
512MB	145.00
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For other Apple memory call or visit: www.uupgrade.com/mapple

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128MB	35.00
256MB	75.00
ThinkPad 240, 390, 570, 600, 770 64MB	30.00
128MB	50.00

For other IBM memory call or visit: www.uupgrade.com/mibm

TOSHIBA MEMORY

Protogé 4000 Series 128MB	50.00
256MB	89.00
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For other Toshiba memory call or visit: www.uupgrade.com/mtoshiba

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*Compaq memory call or visit - www.uupgrade.com/mcompaq
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IBM 80GB 07N8084 7200 RPM	195.00
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Seagate 18GB ST318437LW/LC 7200 RPM	169.00
Seagate 36GB ST336737LW/LC 7200 RPM	275.00
Seagate 181GB ST1181877LW/LCV 7200 RPM	1,465.00
IBM 18GB 07N3240/07N3250 10K RPM	210.00
IBM 36GB 07N6340 10K RPM	375.00
IBM 36GB 07N6370 10K RPM	375.00
IBM 73GB 07N6300 10K RPM	775.00
IBM 73GB 07N6310 10K RPM	775.00
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Fujitsu 36GB MAJ3367MC 10K RPM	345.00
Fujitsu 73GB MAN3735MP/MC 10K RPM	749.00

Please visit: www.uupgrade.com/hdscsi for current pricing

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External FireWire Drives

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Think 20GB Fire-n-Ice FireWire Mobile Drive	249.00
Think 30GB Fire-n-Ice FireWire Mobile Drive	265.00
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*Call for other drives not listed.
Please visit: www.uupgrade.com/hdfire for current pricing

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Think PIXCF-128 128MB	55.00
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WebBuyer

SITE REVIEWS FOR ONLINE SHOPPING

BY KEVIN SAVETZ

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<Tech Shopping

aberdeeninc.com

Targeting savvy consumers, **Aberdeen** features extensive specs on a wide variety of peripherals and accessories. The site's catalog of motherboards spans nine major manufacturers and includes a side-by-side comparison tool.

accessmicro.com

Access Micro boasts tons of items ranging from broadband routers to complete desktop systems. The help desk and hardware guide provide aid to first-time visitors, and the clearance area offers returned items and old inventory for below wholesale prices.

allstarshop.com

The **Allstar Microelectronics** catalog of PC accessories includes graphics cards, motherboards, and peripherals. The selection in some categories is modest, but prices are reasonable, and you'll find an ample amount of information about each product.

a2zcables.com

The only thing that rivals the selection at **A2Z Cables** is the amount of technical information the site provides. You'll find diagrams of connectors, connectivity guides, and details about wiring standards.

batteriesdirect.com

Empower yourself! **Batteries Direct** sells batteries for laptops, camcorders, and portable phones, as well as AC adapters for portable computers. If the kids' toys are running on empty, check out the selection of rechargeable nickel-metal-hydride batteries in sizes ranging from AAA to D.

bestbuy.com

Best Buy sells computers and peripherals, home audio and video, photo gear, and small-office equipment. The selection in each department is impressive. The best part? You can have your gadget delivered, or pick it up at a nearby store.

blackbox.com

Get connected! Specializing in network products, **Black Box's** extensive catalog of storage, cabling, and surge-protection products—plus many other connectivity accessories—can be viewed online or off.

buy.com

Buy.com's vast million-product inventory includes computer hardware, software, electronics, video games, books, music, and DVDs. Shoppers will find informative pages that make choosing the right peripheral painless.

buycase.com

Banish the boring beige box forever! **Colorcase** offers more than 60 unusual computer cases, including translucent-plastic, aluminum, and mirrored. Choose a case with a Plexiglas insert for a look at the innards of your PC.

buydig.com

A site for shovels and trowels? No, **BuyDig.Com** offers digital tools and gadgets including digital cameras, fax machines, PDAs, DVD players, and video-capture devices.

www.buyuptime.com

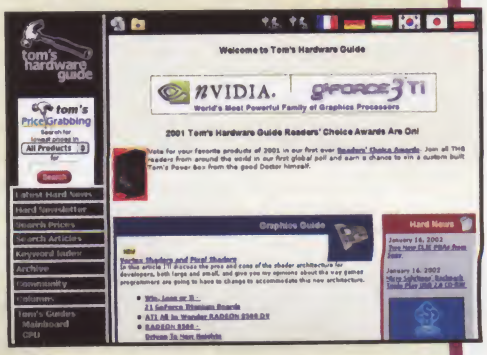
BuyUptime.com's protection and security inventory includes uninterruptible power supplies and accessories, batteries, and power-distribution

APRIL

COMPUTER SHOPPER site OF THE month

tomshardware.com

Tom's Hardware Guide is an unparalleled resource for hardware news and reviews, making it a veritable paradise for the technically inclined. You could spend hours here just soaking up all the geeky goodness.



The heart of the site is the news area, which delivers thoughtful analysis about all aspects of the hardware world. From announcements of new chipsets to comparative motherboard reviews, the site doesn't coddle its readers. In addition, the Columns section goes beyond facts and figures with a hearty (and often humorous) dose of opinion about the tech scene.

The HowTo section serves up informative tutorials for the hard-core enthusiast, including topics such as creating a do-it-yourself RAID system or running Windows inside Linux. The Product Database offers recommendations, specs, and performance data for processors, graphics cards, motherboards, and hard drives. If you're looking to gain intelligence on a particular subject, check out Tom's Guides, comprehensive indexes of information in categories such as audio/video, CPUs, displays, and networking.

The site's message boards are extraordinarily busy, bustling with talk about hardware components, overclocking, peripherals, software, and consumer electronics. If you want to keep up with the latest buzz (and you will), subscribe to Tom's Hard News, a free weekly e-mail newsletter.

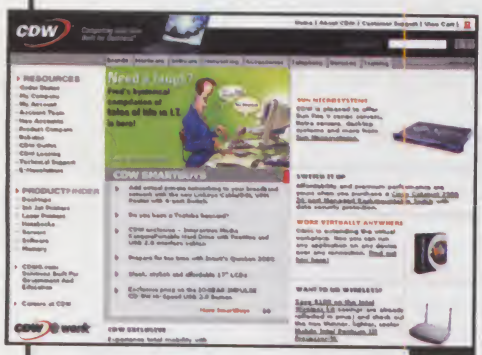
units. The selection ranges from simple surge protectors to industrial transformers.

www.cd-recordable.com

The U.S-owned and -based **CD-Recordable Factory Store** actually manufactures the discs it sells. This easy-to-navigate site stocks a massive variety of CD-R discs, including colorless and tinted media, plus disc-packaging and -storage accessories.

cdw.com

CDW offers an enormous array of hardware and software for business. Create side-by-side comparisons in many product categories, and search out dollar-saving deals on the rebates-and-coupons page.



circotech.com

If a beautiful PC case stops you in your tracks, visit **Circo Technology,** which offers a large selection of attractive and functional cases. For the maximum in upgradability, check out the roomy "cube" cases.

compgeeks.com

Revenge of the nerds, indeed! Shop the **Computer Geeks Discount Outlet** for new, discontinued, and refurbished computer gear. It's a trove for the do-it-yourselfer piecing together a desktop system. The site features low prices and complete specs on every product.

compusa.com

The well-organized **CompUSA** rounds out the usual selection of PC hardware, peripherals, and accessories with areas devoted to electronics and gadgets. The site's new Game Fixx arm specializes in PC and console games.

computerbath.com

As you might have guessed, **ComputerBath** specializes in computer-cleaning products. Put together a customized kit that includes brushes for dust removal, optical-drive cleaners, label removers, and other essential tools for cleaning your PC inside and out.

computers4sure.com

In the 19 well-stocked departments at **Computers-4Sure.com** you'll find a broad spectrum of products, including networking equipment, PDAs, and scanners. Bargain hunters can quickly sniff out deals on the Clearance pages.

computersurplusoutlet.com

You're just crazy enough to build your own desktop system, aren't you? Then you'll feel right at home at **Computer Surplus Outlet,** where you'll find closeouts, overstocks, refurbished equipment, and liquidation items. You might even stumble on an assembly-required Pentium system for less than $100.

crucial.com

One of the largest providers of memory upgrades on the Web, **Crucial Technology** offers free shipping on CompactFlash cards and RAM for 11,000 computer systems. The company backs its memory with a lifetime warranty.

c-source.com

The catalog at decade-old **CompSource** includes a full range of PC products—nearly 200,000 in all. The company promises same-day shipping, but watch out for the 15 percent fee on returns.

dalco.com

Dalco Electronics stocks everything from motherboards to monitors. If you're a bargain hunter, start with the specials found on the home page. You'll also find a helpful motherboard/CPU and memory configurator.

dartek.com

Dartek sells a remarkable selection of hardware, software, networking equipment, and office furniture. Well-designed features include printable spec sheets, customers' product ratings, a product-watch feature, and a frequent-buyers' club.

directron.com

Specializing in computer peripherals, **Directron.com** offers low prices on a wide variety of name-brand and OEM products. Most items include a 30-day guarantee, and any order earns you the right to pick through the Free Stuff bin. Savvy savers will appreciate the Clearance area, as well as frequent-customer and volume-purchasing discounts.

dirtcheapdrives.com

If you can store data on it, this site sells it. **Dirt Cheap Drives** offers hard drives, CD-ROM drives, DVD hardware, and drive arrays, with detailed technical information about each product. This decade-old company also stocks mounting kits, media, and accessories.

ecable.net

You probably had no idea that there were so many ways to hook technology together. **Ecable** sells all types of cables, from coax and Category 5 to fiber-optic, plus patch panels, telco blocks, and other datacom essentials.

ecost.com

The **eCost.com** catalog spans the full range of PC hardware and software, including ready-to-use

SITE REVIEWS

systems, peripherals, accessories, and applications. The Bargain Countdown will tempt you with time-limited deals.

enetfurniture.com

eNet Furniture's expansive selection consists of computer and office furniture from 60 manufacturers. The catalog includes printer stands, accessible furniture for disabled users, and multiperson workstations for computer labs.

etronics.com

There's something for everyone at **Etronics.com.** The catalog includes home-theater products, car electronics, home-office gizmos, plus digital and film cameras. The return policy is flexible: a 30-day guarantee with no restocking fees.

euclidcomputers.com

Euclid Computers stocks laptops from eight manufacturers, PDAs from seven, and a smattering of wireless accessories and GPS receivers. Use the filter tool to hone your laptop choice by CPU speed, screen size, and weight.

flexguard.com

Philadelphia Security Products will make sure your PC stays right where it belongs—on your desk. The site sells a variety of lock and cable kits to protect your notebook or desktop computer against thieves.

fwdepot.com

Catering to both Mac and PC users, **FireWire Depot** sells IEEE 1394 drives, cables, repeaters, and upgrade cards. You can buy an empty enclosure, then populate it with your own drive—online assembly instructions show you how.

googlegear.com

Targeting corporations and smaller businesses, **Googlegear** sells a tempting selection of PC systems, hardware, and software. Seek out savings in the Open Box Shop and the bargain-packed $1 Marketplace.

handspring.com

Get a **Handspring** PDA direct from the source. The site sells Visor handhelds, add-on modules, accessories, and software.

SITE REVIEWS

harddrive.com

Pack rat? **HardDrive.com** has your storage solution. Choosy shoppers will find extensive choices in IDE, SCSI, and IEEE 1394 (FireWire) drives, along with other peripherals. For fashion-forward computer users, a special section features black PC components, from cases to scanners.

hypermicro.com

Hyper Microsystems specializes in storage. The catalog includes CD-ROM and CD-RW drives, tape-backup drives, hard drives, and RAID adapters. Check the Hyper Bundles for ready-to-use RAID and CD-RW starter kits.

inkfarm.com

We're not sure what type of farm printer ink comes from, but we do know that **Inkfarm.com** sells ink and toner with flat-rate shipping. Go with "official" OEM ink, or opt to save big bucks with aftermarket ink that often costs about half the price. You'll find paper, backup tapes, and removable media, too.

www.ink4art.com

Sure, you'll find the usual selection of inkjet cartridges, but **Ink4Art** also sells distinctive goodies that will make your printer happy. Offerings include fluorescent ink cartridges, unusual paper, and project kits for printing on T-shirts and mouse pads.

insight.com

With more than 110,000 items for sale, **Insight** offers an impressive catalog of hardware and software. Customized sites are available for shoppers in the United States, Canada, and the United Kingdom.

jandr.com

Hardware, software, home-office products, and appliances abound at **J&R Computer World,** the New York City-based superstore famed for its selection and, ahem, "brusque" service. Avoid the attitude with this online version, which specializes in cameras, both digital and traditional film models.

www.jdr.com

JDR Microdevices sells PC hardware and accessories—a fair selection at reasonable prices. In the electronics section, tinkerers will find electronic components and kits, integrated circuits, and technical reference books.

lanblvd.com

Wrestling with your old router? Network card not working? **LanBlvd.com** specializes in networking products. You'll find hubs, routers, interface cards, and wireless stations, along with other essentials for your LAN.

www.mediastore.com

Burn, label, and store to your heart's desire with help from **MediaStore.** The site sells CD-R, CD-RW, DVD-R, and DVD-RW discs, as well as drives, software, labelers, and media-packaging material.

megahaus.com

MegaHaus' catalog of "everything high-tech" offers a full spectrum of products, from mice to monitors. The site specializes in storage, including hard drives, RAID solutions, and CD recorders.

memman.com

Desktop and laptop memory sold at **Memory Man** carries a lifetime warranty, and the site's reference guide offers RAM-configuration info for all brand-name computers.

memory4less.com

Memory4Less.com offers low prices on a wide variety of RAM. Don't know the memory requirements of your computer or digital camera? The site will clue you in.

microcenterorder.com

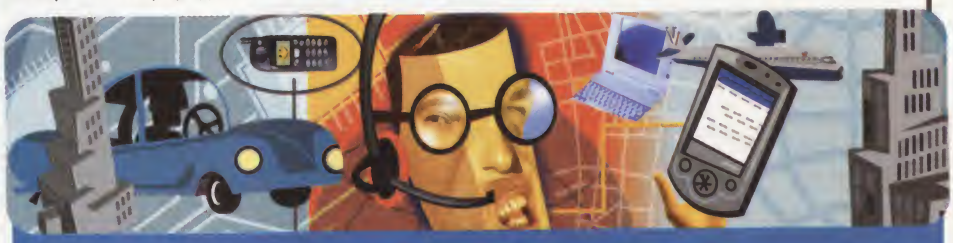
Micro Center Online offers new and refurbished desktops from Compaq, Apple, Hewlett-Packard, and PowerSpec. You'll also find a decent selection of peripherals. Rummage through the bargain bin for deals on closeouts, refurbished units, and overstocks.

motherboardexpress.com

Don't be overwhelmed by the array of more than 100 boards at **Motherboard Express.** The site's search engine will filter the choices by processor type, onboard controller, chipset, case type, or number of CPUs.

motherboards.com

In addition to a wide selection of motherboards with copious technical specs on each, **Motherboards.com** provides honest reviews from picky system shoppers like you. If you order a motherboard and CPU together, the company will configure and test them for you.



Mobile Gear

laptoptravel.com

If you tote a computer wherever you go, be sure make a stop at **Laptop Travel.** The site specializes in portable-computing and international-travel gear. The catalog includes services to keep you connected on the road, along with electrical adapters, modem converters, and security accessories. You'll also find news and nifty travel tips in the Information area.

www.mobile-mania.com

If you're crazy for on-the-go gear, you'll flip for **Mobilemania.com.** This site sells travel-size computers, printers, and fax machines. You'll also find PDAs, digital cameras, and all the mobile accessories you could ever need.

mobileplanet.com

MobilePlanet is home to a gaggle of high-tech tools and toys for mobile professionals. The selection includes notebooks, PDAs, wireless-communication products, portable printers, and tiny scanners. You can also stock up on software for your Palm- or Windows CE-based handheld.

mobilizenow.com

On the go? **MobilizeNow** can outfit you with the gadgets you need, including cellular gear, GPS receivers, portable radios, and PDA stuff. Tell the site what country you're headed for, and it will show a list of appropriate electrical adapters, phone adapters, and voltage converters.

neohand.com

Neohand specializes in Palm OS and Pocket PC software for business and leisure travelers. The selection includes titles such as Weissmann City Profiles, a destination guide; Global Advisor, business- and cultural-etiquette software; and DialerPro, which helps you make calls from one foreign country to another.

www.pdamart.com

PDA Mart offers a hefty online catalog including Palm, Pocket PC, and Windows CE PDAs, plus a host of other electronic organizers and data banks. Cases, add-on cards, wireless gear, and GPS accessories round out the selection.

ILLUSTRATIONS BY BILL RIESER

SECTION CONTINUES ON PAGE 174

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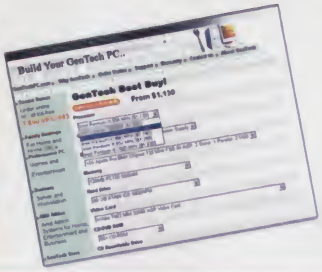

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POWERED BY DDR MEMORY

Athlon XP 1700+.....$899
Athlon XP 1800+.....$909
Athlon XP 1900+.....$969
Athlon XP 2000+.....$1,039

XP Gamer ES

- 320 watts Medium Tower Case w/2 Extra Case Fan
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- 256 MB PC266 DDR SDRAM
- nVidia GeForce2 MX-400 64MB 4X AGP Video Card
- 56K V.90 PCI FaX/Data/Voice Hardware Modem
- Creavite Sound Blaster Live Value 5.1 Sound Card
- 60 GB UltraATA 100 Hard Drive
- 16X DVD-ROM Drive add $69
- 24X10X40 CD-RW Drive w/Burn-Proof
- 1.44 Floppy Drive
- Internet Scroll Mouse PS2
- WinTurbo 2000 Keyboard PS2
- 3D Stereo Speaker
- Desktop Microphone
- 17" .27 1280X1024 High Resolution Monitor add $150
- Microsoft Windows XP Home Edition or Windows ME
- Free Lotus Smartsuite Millennium Edition Software
- 1 Year On-Site Service, add $29

POWERED BY DDR MEMORY

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Athlon XP 1700+.....$749
Athlon XP 1800+.....$759
Athlon XP 1900+.....$819
Athlon XP 2000+.....$889

XP Gamer Pro

- 320 watts Medium Tower Case w/2 Front USB Ports
- VIA KT266A DDR Chipset 266 MHz FSB Mainboard
- 2 Serial, 1 Parrallel, 4 USB Ports, 2 Extra Case Fan
- 512 MB PC266 DDR SDRAM
- nVidia GeForce 4 MX-440 64 MB DDR 4X AGP Video Card w/TV Out
- 56K V.90 PCI FaX/Data/Voice Hardware Modem
- Creative Sound Blaster Audigy X-Gamer 5.1 Sound Card
- 80 GB UltraATA 100 7200 rpm Hard Drive
- 16X DVD-ROM Drive
- 32X10X40 CD-RW Drive w/Burn-Proof
- 1.44 Floppy Drive
- Microsoft Intellimouse PS2
- Multimedia Internet Keyboard PS2
- Altec Lansing AVS 500 5 Piece Subwoofer Speaker System
- Desktop Microphone
- 19" .25 1600X1200 High Resolution Monitor
- Microsoft Windows XP Home Edition or Windows ME
- Free Lotus Smartsuite Millennium Edition Software
- 1 Year On-Site Service, add $39

POWERED BY DDR MEMORY

Athlon XP 1700+.....$1,419
Athlon XP 1800+.....$1,429
Athlon XP 1900+.....$1,479
Athlon XP 2000+.....$1,559

XP Gamer XL

- 320 watts Medium Tower Case w/2 Front USB Ports
- VIA KT266A DDR Chipset 266 MHz FSB Mainboard
- 2 Serial, 1 Parrallel, 4 USB Ports, 2 Extra Case Fan
- 1024 MB PC266 DDR SDRAM
- nVidia GeForce 4 MX-440 64 MB DDR 4X AGP Video Card w/TV Out
- 56K V.90 PCI FaX/Data/Voice Hardware Modem
- Creative Sound Blaster Audigy Platinum 5.1 Sound Card
- 120 GB UltraATA 100 7200 rpm Hard Drive
- 16X DVD-ROM Drive
- Pioneer DVR- A03 DVD-RW Drive
- 1.44 Floppy Drive
- Microsoft Optical Intellimouse USB
- Microsoft Internet Keyboard PS2
- Creative Inspire 5.1 6 Piece Subwoofer Speaker System
- Desktop Microphone
- 19" .25 1600X1200 High Resolution Monitor
- Microsoft Windows XP Home Edition or Windows ME
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Athlon XP 1800+.....$2,049
Athlon XP 1900+.....$2,099
Athlon XP 2000+.....$2,179

AMD Best Buy DDR

- 320 watts Medium Tower Case w/2 Extra Case Fan
- VIA KT266A DDR Chipset 266 MHz FSB Mainboard
- 2 Serial, 1 Parrallel, 2 USB Ports
- 256 MB PC266 DDR SDRAM
- nVidia GeForce2 MX-400 64MB 4X AGP Video Card
- 56K V.90 PCI FaX/Data/Voice Hardware Modem
- AC97 Digital Audio Controller
- 60 GB UltraATA 100 Hard Drive
- 16X DVD-ROM Drive add $69
- 32X10X40 CD-RW Drive w/Burn Proof
- 1.44 Floppy Drive
- Internet Scroll Mouse PS2
- WinTurbo 2000 Keyboard PS2
- 3D Stereo Speaker
- Desktop Microphone
- Microsoft Windows XP Home Edition or Windows ME
- Free Lotus Smartsuite Millennium Edition Software
- 10/100 Ethernet Controller
- 1 Year On-Site Service, add $29
- 19" .25 1600X1200 High Resolution Monitor add $225

POWERED BY DDR MEMORY

Athlon XP 1700+.....$769
Athlon XP 1800+.....$779
Athlon XP 1900+.....$839
Athlon XP 2000+.....$909

GenTech Best Buy P-4

- 320 watts Medium Tower Case
- SIS 645 Pentium-4 DDR Chipset Mainboard
- 2 Serial, 1 Parrallel, 2 USB Ports
- 256 MB PC266 DDR SDRAM
- nVidia GeForce2 MX-400 64MB 4X AGP Video Card
- 56K V.90 PCI FaX/Data/Voice Hardware Modem
- AC97 Digital Audio Controller
- 60 GB UltraATA 100 Hard Drive
- 16X DVD-ROM Drive
- 24X10X40 CD-RW Drive w/Burn-Proof
- 1.44 Floppy Drive
- Internet Scroll Mouse PS2
- WinTurbo 2000 Keyboard PS2
- 3D Stereo Speaker
- Desktop Microphone
- 10/100 PCI Ethernet Card
- Microsoft Windows XP Home Edition or Windows ME
- Lotus Smartsuite Millennium Edition Software
- 1 Year On-Site Service, add $29
- 19" .25 1600X1200 High Resolution Monitor add $225

POWERED BY DDR MEMORY

Intel Pentium-4 1.6 GHz $829
Intel Pentium-4 1.7 GHz $859
Intel Pentium-4 1.8 GHz $879
Intel Pentium-4 1.9 GHz $929
Intel Pentium-4 2.0 GHz $1,039
P-4 2.2 GHz $1,229

Performance 8000

- 320 watts Medium Tower Case w/2 Front USB Ports
- SIS 645 Pentium-4 DDR Chipset Mainboard
- 2 Serial, 1 Parrallel, 4 USB Ports
- 512 MB PC266 DDR SDRAM
- nVidia GeForce 4 MX-440 64 MB DDR 4X AGP Video Card w/TV Out
- 56K V.90 PCI FaX/Data/Voice Modem
- Creative Sound Blaster Live Value 5.1 Sound Card
- 80 GB UltraATA 100 7200 rpm Hard Drive
- 16X DVD-ROM Drive
- 32X10X40 CD-RW Drive w/Burn-Proof
- 1.44 Floppy Drive
- Microsoft Intellimouse PS2
- Multimedia Internet Keyboard PS2
- Altec Lansing AVS 500 5 Piece Subwoofer Speaker System
- Desktop Microphone
- 19" .25 1600X1200 High Resolution Monitor
- Microsoft Windows XP Home Edition or Windows ME
- Free Lotus Smartsuite Millennium Edition Software
- 1 Year On-Site Service, add $29

POWERED BY DDR MEMORY

Intel Pentium-4 1.7 GHz.....$1,389
Intel Pentium-4 1.8 GHz.....$1,409
Intel Pentium-4 1.9 GHz.....$1,459
Intel Pentium-4 2.0 GHz.....$1,569
P-4 2.2 GHz $1,759

Performance 9000

- 320 watts Medium Tower Case w/2 Front USB Ports
- SIS 645 Pentium-4 DDR Chipset Mainboard
- 2 Serial, 1 Parrallel, 4 USB Ports
- 1024 MB PC266 DDR SDRAM
- nVidia GeForce 4 MX-440 64 MB DDR 4X AGP Video Card w/TV Out
- 56K V.90 PCI FaX/Data/Voice Modem
- Creative Sound Blaster Audigy Platinum 5.1 Sound Card
- 120 GB UltraATA 100 7200 rpm Hard Drive
- 16X DVD-ROM Drive
- 32X10X40 CD-RW Drive w/Burn-Proof
- 1.44 Floppy Drive
- Microsoft Optical Intellimouse USB
- Microsoft Internet Keyboard PS2
- Creative Inspire 5.1 6 Piece Subwoofer Speaker System
- Desktop Microphone
- 19" .25 1600X1200 High Resolution Monitor
- Microsoft Windows XP Home Edition or Windows ME
- 10/100 Ethernet Controller
- Free Lotus Smartsuite Millennium Edition Software
- 1 Year On-Site Service, add $39

POWERED BY DDR MEMORY

Intel Pentium-4 1.8 GHz.....$1,829
Intel Pentium-4 1.9 GHz.....$1,879
Intel Pentium-4 2.0 GHz.....$1,989
P-4 2..2 GHz $2,169

Pioneer DVD-RW
DVR-A03 $429

KDS RAD-5P
15" LCD Monitor
1024X768 @75Hz
Mouse Included
$369

KDS RAD-7
17" Ultra-Thin LCD Monitor
1280X1024 @75Hz
Mouse & Keyboard included
$679

ASUS V8200-TI200
Deluxe GeForce-3
64MB DDR Video Card
Video-in,Video-Out, 3D-Glasses Included
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- Sound & Pcmcia
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- Battery & adapter
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- Sound & Pcmcia
- Serial, parallel, vga, usb ports
- Battery & Adapter
- 56k fax
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IBM 390E

$549

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- Accupointer
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- Battery & adapter
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$499

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- Floppy
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- Battery & adapter
- 33.6k fax
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IBM

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Pentium 166 32/2.1 12.1" Fstn cd

- Pentium 166
- 32 meg ram
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- 8x cd rom
- Accupointer
- Sound
- Floppy
- Serial, parallel, vga, usb, ports
- Battery & adapter
- 33.6k fax
- Refurbished

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monitoroutlet.com

From inexpensive 14-inchers to elegant and pricey flat-panel LCDs, **Monitor Outlet** proffers a wide range of displays. The site sells units from 24 manufacturers, plus specialty monitors such as touch screens, wide-aspect-ratio units, and projectors.

mushkin.com

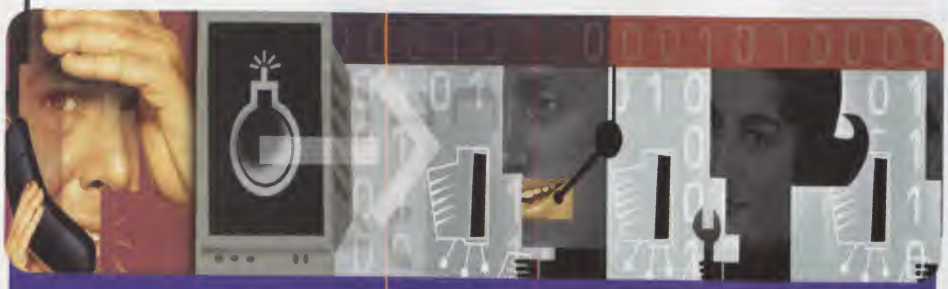
Mushkin Enhanced Memory Systems is a respected company that sells a wide range of RAM, from double-data-rate SDRAM to specialty modules. You'll also find memory for your digital camera or notebook. Don't forget to check out the deals in the Close Out Corner.

newegg.com

You won't have to shell out big bucks or scramble for hardware at **NewEgg.com**. Peck at the site's listings of new products and top sellers, then take a crack at the specials. Order carefully—the 15 percent restocking fee might make you squawk.

nxgen.com

Next Generation's Web site is densely packed with prebuilt computers and peripherals ranging from cables to graphics cards. The selection is huge, and the site provides full specs and plenty of details about each product.



Tech-Support Services

www.answerteam.com

Sykes AnswerTeam provides telephone and online tech support for more than 150 hardware and software products. You can opt for the $14.99 per-call rate, or choose from monthly or annual support services.

askdrtech.com

If you need technical hand-holding on a regular basis, try **Ask Dr. Tech.** For an annual fee of $89, you'll have access to 24/7 online and phone support for hardware and software. The $129 Business Plan adds online data backup and priority response time.

experts-exchange.com

Computer experts helping experts for free—that's the goal at **Experts Exchange.** The site is packed with knowledgeable answers about networking, programming, databases, and other advanced topics. Using an unusual barter system, you have to spend "question points" to get answers, so don't blow them all on simple problems.

pcmech.com

PC Mechanic doles out in-depth tutorials for savvy computer users, such as guides to building your own PC and unraveling the mysteries of the Windows Registry. Ask your tech-support questions in the busy discussion forums.

techguy.org

Tech Support Guy is an active, free support community. You can use the message boards to ask and answer questions about Windows, Unix, networking, business applications, and other PC topics.

techsupportalert.com

Tech Support Alert helps computer users locate online technical support. You'll find reviews of free and for-pay support sites, plus how-to guides for Windows users. The site is only updated sporadically, but it's still worth visiting.

tech24inc.com

Describe your computer problem at **Tech24's** site, and a certified technician will help you solve it, communicating via chat window or phone—any time, day or night. The tech expert can even take control of your PC to fix a problem. If you're satisfied, you pay a flat per-incident rate of $11.95.

SITE REVIEWS

1coolpc.com

A cool computer is a happy computer. **1CoolPC** specializes in fans, heat sinks, and other cooling devices for your CPU, graphics card, monitor, hard drive, and other components that tend to swelter.

Fry's Outpost.com

outpost.com

Fry's Outpost.com sells around 170,000 products—a full range of computer hardware, plus cameras, electronics, and innovative specialty products from partner companies.

palmgear.com

Users of handhelds will appreciate the extensive selection of free and commercial programs downloadable from **PalmGear.com.** You can buy PDA hardware and accessories, or sign up for an e-mailing list to receive information about new software, news, and user tips.

pccasegear.com

Trick out your computer at **PC Case Gear,** an unusual site for serious PC enthusiasts. You can pick up a window kit that will let you see inside your PC case. Couple that with a neon- or cathode-light kit to make your machine glow from the inside.

pcconnection.com

PC Connection offers bargains on a colossal variety of PC and Macintosh products. Smart Selectors ease the search process for those looking for turnkey systems, cameras, printers, monitors, or memory to fit specific guidelines.

www.pcliquidator.com

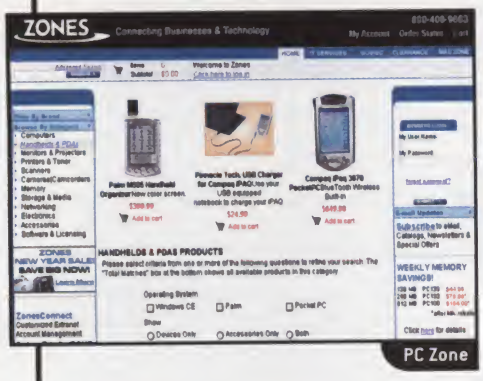
The getting's good at **PC Liquidator,** a site that offers clearance, refurbished, and overstocked hardware and software. The inventory is always changing and usually inexpensive. You can find many hardware choices for under $10—and software for 99 cents.

pcmall.com

Shoppers at **PC Mall** receive free lifetime technical support on the site's vast selection of computers, hardware, and software. The site's business-solutions forum offers corporate leasing and volume pricing. Apple-heads can find all their favorite Macintosh products at the **Mac Mall** sister site ***(www.macmall.com)***.

pcnation.com

You'll pledge allegiance to **PCNation** after seeing its catalog of 70,000 hardware, software, and networking products. The home page offers links to "best buys" and to products with special rebates.



PC Zone

pczone.com

PC Zone stocks an impressive selection of all things PC. You'll find links to a clearance area and other stores: **Mac Zone** and **Electronics Zone.** Printable rebate coupons can save you some cash.

www.pdaorder.com

PDAOrder sells personal digital assistants preloaded with the software you need. Bundles include programs for physicians, professionals, financial mavens, and college students. The site also offers reviews, feature articles, and how-to guides.

powernotebooks.com

Choose among Toshiba, Sager, and PowerPro portable computers at **PowerNotebooks.com.** If you already have a laptop, follow the Accessories Store link to quickly see a list of compatible add-ons.

www.sharbor.com

Safe Harbor specializes in digital video, animation, graphics, and multimedia tools. The selection includes video workstations, video-capture cards, and software for music and video professionals.

Safe Harbor

shopper.cnet.com

The **CNET Shopper** search engine takes the guesswork out of finding a deal on hardware, software, and accessories. The price-drop-alerts feature will show you products with significant recent price reductions. (CNET Networks is *Computer Shopper's* parent company.)

ssdonline.com

At **State Street Direct,** shoppers will discover a huge selection of computers and imaging products. Digital-camera shoppers will find many items of interest, including customized comparison charts.

staples.com

Yeah, they've got that. **Staples'** Web site offers a liberal price-matching policy on computer accessories, software, and office supplies. If you order similar items often, you can set up personalized shopping lists. The company can occasionally take its time shipping items out to you, though, so beware.

store.palm.com

Put a personal digital assistant in the palm of your hand. Here's where **Palm** sells its popular PDAs, plus software, accessories, and replacement parts. Reconditioned and discontinued models are available at a significant discount.

superwarehouse.com

SuperWarehouse.com stocks printers, monitors, hard drives, scanners, digital cameras, and laptops. The site's selection of printers is particularly large, and even includes plotters, dot matrix units, and other special-use printers.

suppliesusa.com

Feed your PC's ravenous appetite for media, ink, and other consumables at **Suppliesusa.com,** a distributor of brand-name printer and computer supplies. The catalog includes data-storage supplies, printer accessories, papers, and film.

surpluscomputers.com

Surplus Computers buys and sells corporate excess, overstock, and slightly obsolete PC hardware and software. The hardware choices include desktops, notebooks, and parts. The software selection includes operating systems and office suites.

tccomputers.com

In business since 1988, **TC Computers** sells fully configured systems and peripherals. The company's specialty is motherboards; buyers can have boards and processors preinstalled and tested without paying extra.

tcwo.com

Thompson's Computer Warehouse Outlet offers only a small selection of computer products. You may find only a dozen monitors or four CD-ROM drives, but the prices are fantastic.

SITE REVIEWS

TechStore.com

techstore.com

TechStore.com offers hardware in dozens of categories and highlights monthly top sellers. The site also sells software, ranging from productivity suites to children's titles.

thenerds.net

With no misgivings about the tech-savvy of its company or customers, **TheNerds.net** offers 60,000 computer products, ranging from cables and connectors to graphics cards, at its fast and friendly site. The liberal 30-day return policy will protect you from getting stuck with the wrong product.

triocomputers.com

TrioComputers.com offers an impressive array of computer accessories and configure-your-own PCs. Read the site's 10-step tutorial on building your own PC to see if you're up to the challenge.

tristatecomputer.com

You'll have three times the fun at **Tri-State Camera and Computer.** The selection includes digital and analog cameras, computer peripherals, and home/office necessities, all with a money-back guarantee.

warehouse.com

The three "warehouses" under **MicroWarehouse's** roof sell PC hardware, Mac products, and datacom components. The site accepts corporate, educational, and government accounts, and offers business leases on several of its products.

<Direct PC Vendors

adamant.com

Adamant Computers' desktop and notebook systems are backed by a three-year warranty and lifetime technical support. Systems are highly configurable, including your choice of AMD and Intel processors.

www.alienware.com

Alienware can build you a gamer's dream machine, high-performance workstation, or desktop video system. Cases are available in a rainbow of out-of-this-world colors.

buyabs.com

Exceptional customer support on custom-configured desktop and notebook systems is the goal at **ABS Computer Technologies.** All systems include a 30-day money-back guarantee, and some are available with Linux preinstalled.

buy-atlas.com

Atlas Micro offers desktop PCs built around Pentium, Celeron, and AMD processors. Buyers can use drop-down menus to create a custom configuration and are protected by a reasonable 30-day return policy.

compaq.com

Three arms of **Compaq Computer's** site offer computers for everyone. See the Compaq AtHome division ***(athome.compaq.com)*** for home and home-office systems, DirectPlus ***(www.directplus.compaq.com)*** for business PCs and servers, or the Compaq Factory Outlet Superstore ***(www.compaqfactoryoutlet.com)*** for big bargains.

cyberpowerinc.com

Each **CyberPower** PC includes a three-year warranty and 30-day money-back guarantee. The site's service area includes downloadable drivers and lifetime tech support.

dell.com

Dell Computer's electronic storefront has always led the way in ease of use. The site is jam-packed with detailed information that makes it a snap to match a machine to your needs. Each system is configurable to the nth degree via drop-down menus, and you can get quick access to online support customized for your PC.

falcon-nw.com

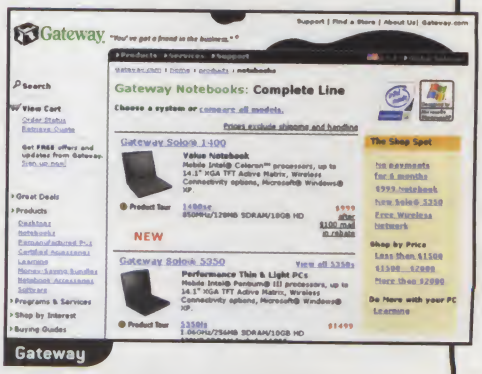
Got gaming on the brain? **Falcon Northwest** builds customized scream machines that will make gamers drool on their keyboards.

www.fujitsu-pc.com

Fujitsu's site focuses on portable computing, including notebook PCs and pen-based tablet computers. Each computer includes several warranty options. A trade-in program offers cash back on your old computer when you upgrade to certain models.

gateway.com

One of the biggest players in online computer sales, **Gateway** has an enormous and informative site that sells custom-built desktops and portables. Check out the Deal of the Week and remanufactured-PC center.



hpshopping.com

At this site, **Hewlett-Packard** sells its lines of desktop and notebook computers, handhelds, PDAs, digital cameras, scanners, and printers. The site makes repeat purchases simple for businesses and individuals.

ibm.com/products

ShopIBM sells business and home PCs, notebooks, servers, thin clients, networking equipment, and

Travel

cheaptickets.com

In business for more than 15 years, **Cheap Tickets** specializes in discount leisure travel. You can make hotel and car-rental reservations, or book a flight online. But you'll have to register before you can even search for ticket prices.

expedia.com

At **Expedia,** travelers can book flights, hotel rooms, cars, vacation packages, and cruises. The FareTracker tool keeps tabs on price changes on your favorite routes and sends e-mail alerts accordingly. Other special features include a currency converter and a frequent-traveler-program tracker.

hotwire.com

Traveling on a budget? **Hotwire** promises deep discounts on airline tickets—if you're flexible. Pick the dates of travel and see the price up front, but you won't know the airline or flight times until after you make the purchase. You can get a great deal, but you won't earn frequent-flyer miles.

lowestfare.com

Lowestfare.com is a full-service provider of business- and leisure-travel services. The site provides travel guides for 60 popular destinations, last-minute specials, and online-bookable cruises.

orbitz.com

The brainchild of five major airlines, **Orbitz** is a sprightly newcomer selling flight tickets, hotels, car rentals, and cruises. Airfare prices at Orbitz are often less expensive than you'll find at other travel sites—even with the $5 per-ticket service fee. And a flight search at Orbitz usually generates a more comprehensive list of choices than the competition.

travelocity.com

Travelocity.com is a popular travel hub that sells airline tickets, hotel and car reservations, cruises, and vacation packages. Check the Fare Watcher to keep abreast of changing airfares. The Business Travel Center offers helpful services for corporate travelers. You can book your trip on your PDA, then get news about your trip on your pager.

peripherals. The build-to-order option allows buyers to customize a new desktop.

microexpress.net

Micro Express offers built-to-order desktop and notebook computers featuring AMD and Intel processors. Each system includes a 30-day guarantee and a one- to four-year warranty. Business leases are available.

micronpc.com

One of the largest direct PC vendors, **MicronPC** sells computers to home-office users, larger businesses, government buyers, and buyers outside the United States. The Factory Outlet offers refurbished and discontinued systems.

nutrend.com

Custom-configure a home or business desktop PC at **NuTrend Computer Products.** The company stocks machines running your choice of Intel or AMD processors. Each system comes with a three-year warranty.

sagernotebook.com

Specializing in notebook computers, **Sager** offers a variety of options, from budget machines to speedy multimedia units. Service includes a 72-hour repair-turnaround guarantee and lifetime free tech support. Business leases are available.

shopprostar.com

Each computer in **ProStar Computer's** line of notebook PCs is backed by a 30-day money-back guarantee, a speedy-repair promise, and free tech support.

shoptoshiba.com

The Web home for **Toshiba's** stylish portables and desktop systems doesn't offer as many build-to-order options as some other sites, but it's loaded with plenty of extended-warranty and lease options.

sonystyle.com/vaio

SonyStyle is a sleek-looking site selling Sony's line of VAIO desktops and notebooks, plus digital cameras, displays, and storage devices.

SonyStyle

store.apple.com

Apple Computer's well-designed site allows you to custom-configure any Macintosh computer, and offers a wide array of Mac-compatible software and accessories. Beware the one-click ordering feature—it may be a bit too convenient for impulse buyers!

voodoopc.com

Voodoo Computers specializes in high-end desktop PCs for gamers, video producers, graphics professionals, and just plain old folks who want a dream machine. The site includes active community forums for chatting with other Voodoo owners.

winbook.com

Focusing exclusively on portables, **WinBook Computer** offers machines with a 30-day money-back guarantee, a one-year warranty, and free technical support. Ironically, some of the site's best deals, the daily "Web specials," can only be ordered by phone.

<PC Resources

bizrate.com

BizRate.com shares customers' opinions of thousands of online sellers, including prices and on-time delivery stats. Click to the Special Offers section for rebates, discounts, and free-shipping deals at hundreds of merchants.

dcresource.com

The **Digital Camera Resource Page** is an unbiased, comprehensive source of information for digital-camera buyers and owners. Shoppers can glean necessary info from the FAQ page, buyer's guide, message boards, and reviews.

dealcatcher.com

With a tenacious ability to help you find a bargain, **DealCatcher.com** is a site worth checking before making any online purchase. You'll find coupon codes, one-day deals, discounts, rebates, and free-shipping offers for products and services from more than 400 Web merchants.

dealnews.com

Deal yourself in! Updated daily, **Dealnews** is a fantastic buyer's guide that reports on low-price specials in Web stores. Check out sister sites **Dealmac** for Mac-oriented gotta-haves and **Dealram** for memory deals.

gomez.com

Gómez.com offers ratings and customer reviews of e-commerce sites in 30 categories, ranging from Web-based computer stores to drugstores, apparel vendors to online brokers. Check the ratings on ease of use, customer confidence, and cost.

lowendpc.com

Stretch the lifespan of that old computer. **Low End PC** focuses on budget computing tips, including running free operating systems and piecing together an inexpensive PC from parts. Sister site **Low End Mac** will help keep your older Mac ticking, too.

SITE REVIEWS

motherboards.org

Motherboards.org is packed with motherboard news, reviews, specifications, and tips. Its comprehensive database of 1,400 products includes driver information, technical details, and overclocking hints.

nextag.com

NexTag is a sophisticated buying service that can help frugal shoppers find the lowest possible prices on computer equipment, electronics, books, music, and videos. Entering your ZIP code allows NexTag to calculate shipping and tax for accurate pricing.

pdastreet.com

No matter which PDA you use, there's something for you at **PDAStreet.com.** This multifaceted site delivers reviews, software downloads, user tips, and classified ads for Windows CE, Palm, Visor, Psion, and RIM users.

PDAStreet.com

the-gadgeteer.com

The Gadgeteer, a site run by two self-proclaimed lovers of electronic gizmos, offers hundreds of reviews of PDAs and accessories including cases, styli, and hardware add-ons. Check out the active message boards for discussion forums about PDAs, handheld games, MP3 players, and more.

<Software Sites

buypcsoft.com

Buypcsoft.com offers software for Windows PCs in categories from business management to voice recognition. It's an efficient site with a good selection and high ratings among previous and current customers.

chumbo.com

Chumbo.com's selection of PC software includes games, business software, kids' programs, and operating systems. You'll also find software for your TV—that is, a good selection of DVD movies.

compuexpert.com

If you crave games for your Mac or PC, stop by **Compuexpert.com.** The categories include racing simulations, sports games, strategy games, and adventure titles. Colorful descriptions and screenshots are given for most titles.

download.cnet.com

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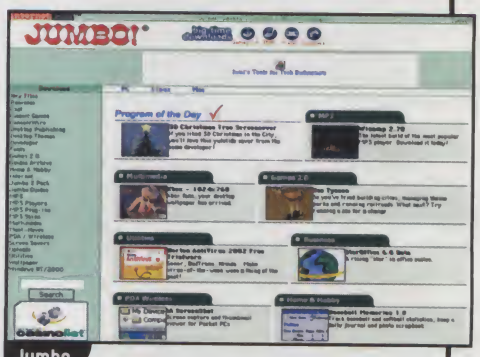

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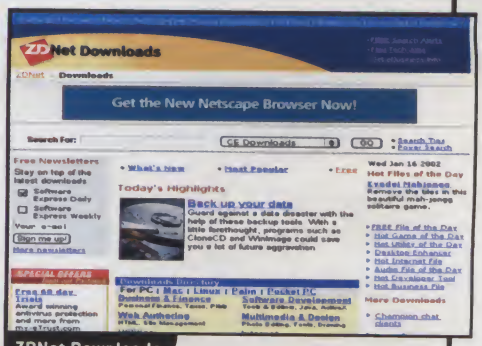

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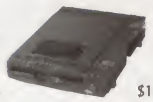

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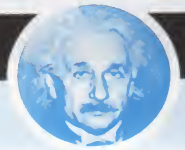

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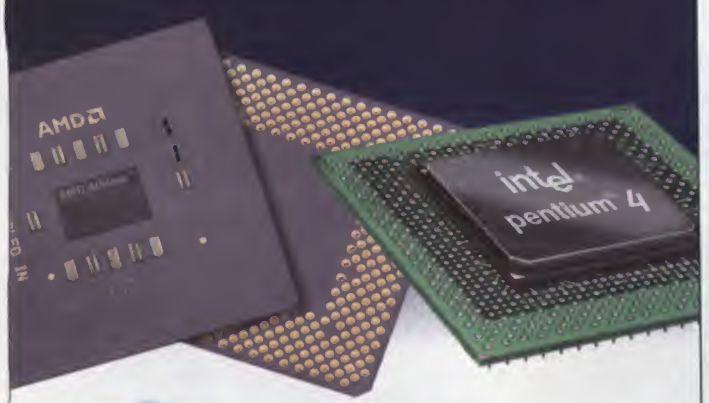

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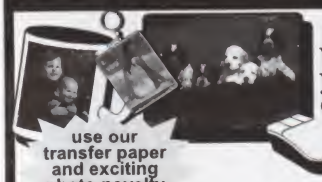

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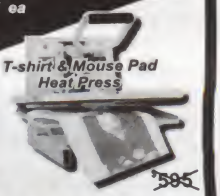

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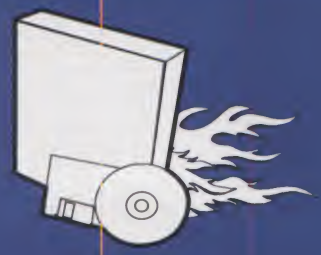

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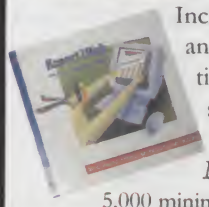
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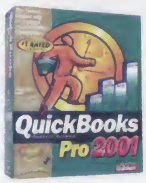

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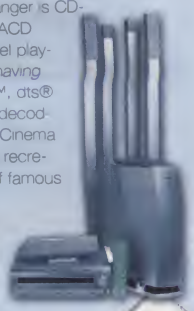

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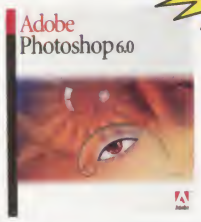

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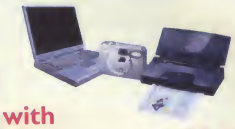

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PC PROGRESS

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ABIT www.abit-usa.com

SKU	CPU	PCI	ISA	AGP	MEM	STYLE	PRICE
ABKG7-LITE	SOCKET A	6		1	2/DDR	ATX	$103
ABKT7A-RAID	SOCKET A	6	1	1	3/168	ATX	$106
ABKG7	SOCKET A	6		1	4/DDR	ATX	$106
ABBW7	P4(SKT 423)	6		1	3/168	ATX	$112
ABBL7	P4(SKT 478)	6		1	3/168	ATX	$119
ABBW7-RAID	P4(SKT 423)	6		1	3/168	ATX	$122
ABBD7	P4(SKT 478)	6		1+CNR	2/DDR	ATX	$122
ABKG7-RAID	SOCKET A	6		1	4/DDR	ATX	$123
ABKR7A	SOCKET A	6		1	4/DDR	ATX	$124
ABBL7-RAID	P4(SKT 478)	6		1	3/168	ATX	$127
ABVP6	DUAL 370	5		1	4/168	ATX	$134
ABTH7-RAID	P4(SKT 423)	5		1+CNR	4/RIMM	ATX	$147
ABBD7-RAID	P4(SKT 478)	6		1+CNR	2/DDR	ATX	$149
ABKR7A-133RAID	SOCKET A	6		1	4/DDR	ATX	$152
ABTH7II-RAID	P4(SKT 478)	5		1+CNR	4/RIMM	ATX	$168

ASUS www.asus.com

SKU	CPU	PCI	ISA	AGP	MEM	STYLE	PRICE
ASA7A133-WOA	SOCKET A	5		1+AMR	3/168	ATX	$77
ASTUA266-WOA	FCPGA 1/2	5		1+AMR	2DDR/163	ATX	$79
ASTUV4X-WOA	FCPGA 1/2	6		1	3/168	ATX	$81
ASA7V133-C-WOA	SOCKET A	4		1+AMR	3/168	ATX	$97
ASA7A266	SOCKET A	5		1+AMR	2/DDR	ATX	$107
ASP4S333-WA	P4(SKT 478)	6		1+ACR	3/DDR	ATX	$108
ASA7M266	SOCKET A	4		1+AMR	2/DDR	ATX	$121
ASP4B	P4(SKT 478)	6		1	3/168	ATX	$127
ASP4T	P4(SKT 423)	5		1	4/RIMM	ATX	$134
ASA7V266-WOA	SOCKET A	5		1+ACR	3/168	ATX	$140
ASA7V266-E-WOR	SOCKET A	5		1+ACR	3/168	ATX	$144
ASP4B266-WA	P4(SKT 478)	6		1+CNR	3/DDR	ATX	$157
ASP4T-E-WOA	P4(SKT 478)	5		1+CNR	4/RIMM	ATX	$162
ASA7N266	SOCKET A	5		1+ACR	3/DDR	ATX	$166
ASA7N266-E	SOCKET A	5		1+ACR	3/DDR	ATX	$189

intel www.intel.com

IND845WN	P4(SKT 478)	6		1+CNR	3/168	ATX	$107
IND845BG	P4(SKT 478)	6		1+CNR	2/DDR	ATX	$117
IND845HV	P4(SKT 478)	3		1+CNR	3/168	ATX	$118
IND845PT	P4(SKT 478)	3		1+CNR	2/DDR	ATX	$119
IND845WNL	P4(SKT 478)	6		1+CNR	3/168	ATX	$119
IND845HVL	P4(SKT 478)	3		1+CNR	3/168	ATX	$123
IND845BGL	P4(SKT 478)	6		1+CNR	2/DDR	ATX	$129
IND850MV	P4(SKT 478)	5		1+CNR	4/RIMM	ATX	$133
IND850MD	P4(SKT 478)	3		1+CNR	4/RIMM	ATX	$134
IND845PTL	P4(SKT 478)	3		1+CNR	2/DDR	ATX	$137
IND850MVL	P4(SKT 478)	5		1+CNR	4/RIMM	ATX	$147
IND850MDL	P4(SKT 478)	3		1+CNR	4/RIMM	ATX	$147

MSI www.msicomputer.com

SKU	CPU	PCI	ISA	AGP	MEM	STYLE	PRICE
MIC645ULTR333	P4(SKT 478)	5		1+CNR	3/DDR	ATX	$74
MICK7T266PRO2	SOCKET A	5		1+CNR	3/DDR	ATX	$93
MIC845PRO2LE	P4(SKT 478)	6		1+CNR	3/168	ATX	$106
MIC845PRO	P4(SKT 423)	5		1+CNR	3/168	ATX	$108
MIC266PRO2-RU	SOCKET A	5		1+CNR	3/DDR	ATX	$119
MIC845ULTR-AR	P4(SKT 478)	5		1+CNR	3/DDR	ATX	$122
MIC845PRO4	P4(SKT 478)	5		1+CNR	3/168	ATX	$122
MIC845PRO4L	P4(SKT 478)	5		1+CNR	3/168	ATX	$125
MIC850PRO2LE	P4(SKT 423)	4		1+CNR	4/RIMM	ATX	$127
MIC694DPRO-2R	DUAL 370	5		1+CNR	4/168	ATX	$128
MIC850PRO5	P4(SKT 478)	4		1+CNR	4/RIMM	ATX	$132
MIC850PRO	P4(SKT 423)	5		1+CNR	4/RIMM	ATX	$136
MIC845ULT-ARU	P4(SKT 478)	5		1+CNR	3/DDR	ATX	$137
MICK7N420PRO	SOCKET A	5		1+CNR	3/DDR	ATX	$157

GIGABYTE www.giga-byte.com

SKU	CPU	PCI	ISA	AGP	MEM	STYLE	PRICE
GBGA-8SRX	P4(SKT 478)	6		1+CNR	3/DDR	ATX	$83
GBGA-7VTXE+	SOCKET A	5		1	3/DDR	ATX	$92
GBGA-8IDX3	P4(SKT 423)	6		1+CNR	3/168	ATX	$104
GBGA-8IDX	P4(SKT 478)	6		1	3/168	ATX	$102
GBGA-7VTXH+	SOCKET A	5		1+CNR	3/DDR	ATX	$104
GBGA-8IRX	P4(SKT 478)	6		1+CNR	3/DDR	ATX	$115
GBGA-8IDXH	P4(SKT 478)	6	LAN	1	3/168	ATX	$119
GBGA-7DXR+	SOCKET A	5		1+AMR	3/DDR	ATX	$124
GBGA-8TXC	P4(SKT 423)	5		1+CNR	4/RIMM	ATX	$129
GBGA-8IRXP	P4(SKT 478)	6		1+CNR	3/DDR	ATX	$157
GBGA-8ITXE	P4(SKT 478)	5		1+CNR	4/RIMM	ATX	$177
GBGA-8ITXR	P4(SKT 478)	6		1	4/RIMM	ATX	$177

PROCESSORS

ALL CPU'S HAVE A 1 YEAR WARRANTY WHEN PURCHASED WITH A CPU FAN.

intel www.intel.com

INTEL	CELERON-A FCPGA	1000MHZ	128K	$71
INTEL	CELERON-A FCPGA	1000MHZ	256K	$71
INTEL	CELERON-A FCPGA	1100MHZ	128K	$77
INTEL	CELERON-A FCPGA	1100MHZ	256K	$77
INTEL	CELERON-A FCPGA	1200MHZ	128K	$87
INTEL	CELERON-A FCPGA	1200MHZ	256K	$88
INTEL	CELERON-A FCPGA	1300MHZ	256K	$99
INTEL	PENTIUM III 133MHZ BUS	733MHZ	256K FCPGA	$100
INTEL	PENTIUM III 133MHZ BUS	800MHZ	256K FCPGA	$111
INTEL	PENTIUM III 100MHZ BUS	850MHZ	256K FCPGA	$124
INTEL	PENTIUM III 133MHZ BUS	866MHZ	256K FCPGA	$111
INTEL	PENTIUM III 133MHZ BUS	933MHZ	256K FCPGA	$111
INTEL	PENTIUM III 133MHZ BUS	1000MHZ	256K FCPGA	$119
INTEL	PENTIUM III 133MHZ BUS	1100MHZ	256K FCPGA 2	$147
INTEL	PENTIUM III 133MHZ BUS	1200MHZ	256K FCPGA 2	$167
INTEL	PENTIUM III 133MHZ BUS	866MHZ	256K SECC	$99
INTEL	PENTIUM III 133MHZ BUS	1000MHZ	256K SECC	$162
INTEL	PENTIUM 4 400MHZ BUS	1400MHZ	256K SOCKET423	$118
INTEL	PENTIUM 4 400MHZ BUS	1500MHZ	256K SOCKET423	$142
INTEL	PENTIUM 4 400MHZ BUS	1600MHZ	256K SOCKET423	$147
INTEL	PENTIUM 4 400MHZ BUS	1700MHZ	256K SOCKET423	$177
INTEL	PENTIUM 4 400MHZ BUS	1800MHZ	256K SOCKET423	$199
INTEL	PENTIUM 4 400MHZ BUS	1900MHZ	256K SOCKET423	$246
INTEL	PENTIUM 4 400MHZ BUS	2000MHZ	256K SOCKET423	$389
INTEL	PENTIUM 4 400MHZ BUS	1400MHZ	256K SOCKET478	$137
INTEL	PENTIUM 4 400MHZ BUS	1500MHZ	256K SOCKET478	$139
INTEL	PENTIUM 4 400MHZ BUS	1600MHZ	256K SOCKET478	$141
INTEL	PENTIUM 4 400MHZ BUS	1700MHZ	256K SOCKET478	$168
INTEL	PENTIUM 4 400MHZ BUS	1800MHZ	256K SOCKET478	$189
INTEL	PENTIUM 4 400MHZ BUS	1900MHZ	256K SOCKET478	$242
INTEL	PENTIUM 4 400MHZ BUS	2000MHZ	512K SOCKET478	$349
INTEL	PENTIUM 4 400MHZ BUS	2000MHZ	256K SOCKET478	$349
INTEL	PENTIUM 4 400MHZ BUS	2200MHZ	512K SOCKET478	$562

AMD www.amd.com

AMD	DURON	200 MHZ BUS	P800MHZ	$40
AMD	DURON	200 MHZ BUS	P850MHZ	$41
AMD	DURON	200 MHZ BUS	P900MHZ	$43
AMD	DURON	200 MHZ BUS	P950MHZ	$44
AMD	DURON	200 MHZ BUS	P1000MHZ	$53
AMD	DURON	200 MHZ BUS	P1100MHZ	$65
AMD	DURON	200 MHZ BUS	P1200MHZ	$72
AMD	DURON	200 MHZ BUS	P1300MHZ	$93
AMD	SOCKET A ATHLON	200 MHZ BUS	P950MHZ	$61
AMD	SOCKET A ATHLON	200 MHZ BUS	P1000MHZ	$81
AMD	SOCKET A ATHLON	266 MHZ BUS	P1000MHZ	$82
AMD	SOCKET A ATHLON	200 MHZ BUS	P1200MHZ	$101
AMD	SOCKET A ATHLON	266 MHZ BUS	P1200MHZ	$102
AMD	SOCKET A ATHLON	200 MHZ BUS	P1300MHZ	$91
AMD	SOCKET A ATHLON	266 MHZ BUS	P1333MHZ	$93
AMD	SOCKET A ATHLON	200 MHZ BUS	P1400MHZ	$103
AMD	SOCKET A ATHLON	266 MHZ BUS	P1400MHZ	$104
AMD	SOCKET A ATHLON MP	266 MHZ BUS	1500+	$161
AMD	SOCKET A ATHLON MP	266 MHZ BUS	1600+	$172
AMD	SOCKET A ATHLON MP	266 MHZ BUS	1800+	$208
AMD	SOCKET A ATHLON MP	266 MHZ BUS	1900+	$272
AMD	SOCKET A ATHLON XP	266 MHZ BUS	1600+	$119
AMD	SOCKET A ATHLON XP	266 MHZ BUS	1700+	$124
AMD	SOCKET A ATHLON XP	266 MHZ BUS	1800+	$149
AMD	SOCKET A ATHLON XP	266 MHZ BUS	1900+	$204
AMD	SOCKET A ATHLON XP	266 MHZ BUS	2000+	$279

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3com www.3com.com

3C905BTXNM	ETHERNET RJ45 10/100BT NO REMOTE WAKE PCI	$37
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3C905CTXM	ETHERNET RJ45 10/100BT W/REMOTE WAKE PCI	$38
3C905CX-TXM	ETHERNET 32 BIT 10/100XL W/REMOTE WAKE PCI	$38

EDIMAX www.edimax.com

EDEN2000PXA	ETHERNET RJ45/10BT/BNC/AUI ISA FULL DUPLEX	$17
EDEN5200PXA	ETHERNET RJ45/10BT/BNC/AUI PCI FULL DUPLEX	$18
EDEN9130	ETHERNET RJ45 10/100 PCI	$24
EDER5394SR	NETWORK HUB 5 PORT 10BASE-T	$35

MEMORY

72-PIN EDO

16MB	4X32 EDO	60NS	$8
32MB	8X32 EDO	60NS	$15
64MB	16X32 EDO	60NS	$17
128MB	32X32 EDO	60NS	$99

168-PIN LONG DIMMS EDO

64MB	8X64	60NS 3.3VOLT	$77
64MB	8X72 (unbuffered)	60NS 3.3VOLT ECC	$89
64MB	8X72 (buffered)	60NS 3.3VOLT ECC	$49
128MB	16X64	60NS 3.3VOLT	$159
128MB	16X72 (unbuffered)	60NS 3.3VOLT ECC	$179
128MB	16X72 (buffered)	60NS 3.3VOLT ECC	$154
256MB	32X72 (buffered)	60NS 3.3VOLT ECC	$257

168-PIN LONG DIMMS SDRAM (66MHz)

32MB	4X64	10NS	$8
64MB	8X64	10NS	$14
128MB	16X64	10NS	$28

168-PIN SDRAM PC100/133/150

32MB	4X64	8NS	$9
64MB	8X64	8NS	$14
64MB PC133	8X64	7.5NS	$15
64MB	8X72	8NS	$17
128MB	16X64	8NS	$28
128MB PC133	16X64	7.5NS	$28
128MB	16X72	8NS	$34
128MB PC133	16X72	7.5NS	$36
256MB	32X64	8NS	$59
256MB PC133	32X64	7.5NS	$53
256MB	32X72	8NS	$65
256MB PC133	32X72	7.5NS	$69
512MB	64X72	8NS	$149
512MB PC133	64X64	7.5NS	$109
512MB PC133	64X72	7.5NS	$151
1024MB PC133	128X72	7.5NS	$262

DDR RAM PC1600/2100

128MB	16X64	200MHZ	$33
128MB	16X64	266MHZ	$34
128MB	16X72	200MHZ	$40
128MB	16X72	266MHZ	$41
256MB	32X64	200MHZ	$68
256MB	32X64	266MHZ	$69
256MB	32X72	200MHZ	$76
256MB	32X72	266MHZ	$77
512MB	64X72	266MHZ	$152
1024MB	128X72	266MHZ	$399

CORSAIR www.corsairmicro.com

PC100/133/150

CM654S256-BX2	256MB	32X64	8NS	$94
CM654S256-133C2	256MB PC133	32X64 CAS2	7.5NS	$92
CM654S256-150C2	256MB PC150	32X64 CAS2	7NS	$97
CM724S256-133	256MB PC133	32X72	7.5NS	$102
CM724S256-BX2	256MB	32X72	8NS	$102
CM744S512-133	512MB PC133	64X72	7.5NS	$287
CM744S1024-133	1024MB PC133	128X72	7.5NS	$467

RAMBUS

CM616DR128A-800	128MB	RDRAM	800MHZ	$52
CM618DR128A-800	128MB	RDRAM	800MHZ	$54
CM616DR256A-800	256MB	RDRAM	800MHZ	$99
CM618DR256A-800	256MB	RDRAM	800MHZ	$109
CM618DR512-800	512MB	RDRAM	800MHZ	$334

VALUE SELECT MEMORY

VS128MB100	128MB	16X64 (SDRAM)	8NS	$31
VS128MB133	128MB PC133	16X64 (SDRAM)	7.5NS	$31
VS256MB100	256MB PC100	32X64 (SDRAM)	8NS	$62
VS256MB133	256MB PC133	32X64 (SDRAM)	7.5NS	$62
VS256REG133	256MB PC133	32X72 (SDRAM)	7.5NS	$71
VS512MB133	512MB PC133	64X64 (SDRAM)	7.5NS	$119
VS512MB133REG	512MB PC133	64X64 (SDRAM)	7.5NS	$189
VS128MB266	128MB PC2100	16X64 (DDR)	2.5CAS	$37
VS256MB266	256MB PC2100	32X64 (DDR)	2.5CAS	$71
VS512MB266	512MB PC2100	64X64 (DDR)	2.5CAS	$157
VS512MBECC266R	512MB PC2100	64X72 (DDR)	2.5CAS	$179
VS128MB800	128MB PC800	RDRAM		$44
VS128MBECC800	128MB PC800	ECCRDRAM		$51
VS256MB800	256MB PC800	RDRAM		$89
VS256MBECC800	256MB PC800	ECCRDRAM		$101

DDR RAM PC2100/2400

CM64SD128-2100	128MB	16X64 DDR	266MHZ	$54
CM64SD128-2400C2	128MB (CAS 2)	16X64 DDR	300MHZ	$59
CM64SD128-2100C2	128MB (CAS 2)	16X64 DDR	266MHZ	$57
CM72SD128-2100	128MB	16X72 DDR	266MHZ	$71
CM64SD256-2100	256MB	32X64 DDR	266MHZ	$90
CM64SD256-2400C2	256MB (CAS 2)	16X64 DDR	300MHZ	$99
CM72SD256-2100	256MB	32X72 DDR	266MHZ	$107
CM72SD256R-2100	256MB (REG)	32X72 DDR	266MHZ	$109
CM72SD512R-2100	512MB (REG)	64X72 DDR	266MHZ	$207

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TOSHIBA www.toshiba.com

MODEL#	SPEED/TRANS	INTERFACE	ACCESS	CACHE	PRICE
TOSDW2002KIT	6X-24XDVDRAM	ATAPI	120MS	8192K	$389

MITSUMI.COM www.mitsumi.com

MODEL#	SPEED/TRANS	INTERFACE	ACCESS	CACHE	PRICE
MIT48XIDE	48X/7200KB	ATAPI	85MS	128K	$30
MIT48XIDEBLACK	48X/7200KB	ATAPI	85MS	128K	$33
MIT54XIDE	54X/8100KB	ATAPI	85MS	128K	$31
MIT4809OEM	24X/10X/40X	ATAPI OEM	110MS	2048K	$87

YAMAHA www.yamaha.com

MODEL#	SPEED/TRANS	INTERFACE	ACCESS	CACHE	PRICE
YACRW16X10X40	16X/10X/40X	ATAPI	140MS	4096K	$132
YACRW2100SZKIT	16X/10X/40X	SCSI	140MS	4096K	$148
YACRW2200EZKIT	20X/10X/40X	ATAPI	160MS	8192K	$186
YACRW2100FXZKIT	16X/10X/40X	FIREWIRE	160MS	8192K	$319
YACRW2200FXZKIT	20X/10X/40X	FIREWIRE	150MS	8192K	$304

SONY www.sony.com

SY52XIDE	52X/7800KB	ATAPI	85MS	128K	$29
SYCRX140ECHOEM	8X/4X/32X	ATAPI	150MS	4096K	$62
SYCRX160E/CHOEM	12X/8X/32X	ATAPI	150MS	4096K	$93
SYCRX16110EM	16X/10X/40X	ATAPI	150MS	4096K	$90
SYCRX160E/CH	12X/8X/32X	ATAPI	150MS	4096K	$97
SYCRX175E0EM	24X/10X/40X	ATAPI	150MS	8192K	$102
SYCRX1600L/A2	12X/8X/32X	FIREWIRE	150MS	4096K	$217
SYCRX145S/CH	10X/4X/32X	SCSI	150MS	4096K	$247

PLEXTOR www.plextor.com

PX-W1210TA	12X/10X/32X	ATAPI	150MS	2048K	$123
PX-W1610TA	16X/10X/40X	ATAPI	150MS	2048K	$129
PX-W2410TA	24X/10X/40X	ATAPI	150MS	2048K	$144

NOTEBOOK DRIVES

TOSHIBA www.toshiba.com

ALL TOSHIBA IDE NOTEBOOK DRIVES LISTED HAVE A 1YR WARRANTY

MODEL#	CAP.(GB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
T01516GAP	15.0	13MS/4200	1024K	2.5"/9.5MM	$97
T02016GAP	20.0	13MS/4200	1024K	2.5"/9.5MM	$102
T03017GAP	30.0	13MS/4200	1024K	2.5"/9.5MM	$129
T04018GAP	40.0	13MS/4200	2048K	2.5"/9.5MM	$189

IBM. www.ibm.com

ALL IBM IDE NOTEBOOK DRIVES LISTED HAVE A 1YR WARRANTY

MODEL#	CAP.(MB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
IBMIC25N010	10.0	12MS/4200	512K	2.5"/9.5MM	$73
IBMIC25N020	20.0	12MS/4200	2048K	2.5"/9.5MM	$95
IBMIC25N030	30.0	12MS/4200	2048K	2.5"/9.5MM	$135
IBMIC25N040	40.0	12MS/4200	2048K	2.5"/9.5MM	$202
IBMIC25T048	48.0	12MS/5400	2048K	2.5"/9.5MM	$299

MONITORS

ViewSonic www.viewsonic.com

VIE55	15"	.28DP	1280 X 1024	$137
VIE70	17"	.27DP	1280 X 1024	$155
VIE70F	17"	.25DP	1280 X 1024 (FLAT)	$177
VIE70M	17"	.27DP	1280 X 1024	$184
VIE70FB	17"	.25DP	1280 X 1024 (FLAT/BLACK)	$177
VIE90	19"	.27DP	1600 X 1200	$234
VIG70M	17"	.27DP	1280 X 1024	$189
VIG70MB	17"	.27DP	1280 X 1024 (BLACK)	$189
VIE95	19"	.26DP	1600 X 1200	$239
VIPS775	17"	.25DP	1600 X 1280	$279
VIE790	19"	.26DP	1600 X 1200	$244
VIGS790	19"	.26DP	1600 X 1200	$307
VIG90M	19"	.26DP	1600 X 1200	$329
VIG90F	19"	.25DP	1600 X 1200 (FLAT)	$299
VIG90MB	19"	.26DP	1600 X 1200 (BLACK)	$329
VIPF790	19"	.25DP	1600 X 1280	$357
VIPS790	19"	.25DP	1600 X 1280	$504
VIP220F	22"	.25DP	1600 X 1200	$694
VIGS815	21"	.25DP	1920 X 1440	$789
VIP225F	22"	.24DP	2048 X 1536 (FLAT)	$817
VIP817	21"	.25DP	2048 X 1536	$1489
VIVE150	LCD MONITOR 15" VIEWABLE 1024 X 768			$379
VIVX500	LCD MONITOR 15" VIEWABLE 1024 X 768			$529
VIVP150M	LCD MONITOR 15" VIEWABLE 1024 X 768			$539
VIVE170	LCD MONITOR 17" VIEWABLE 1280 X 1024			$677
VIVG171	LCD MONITOR 17.1" VIEWABLE 1280 X 1024			$789
VIVG171B	LCD MONITOR 17.1" VIEWABLE 1280 X 1024 (BLACK)			$789
VIVG175	LCD MONITOR 17.4" VIEWABLE 1280 X 1024			$827
VIVG181	LCD MONITOR 18.1" VIEWABLE 1280 X 1024			$989
VIVG191	LCD MONITOR 19.1" VIEWABLE 1280 X 1024			$999
VIVG191B	LCD MONITOR 19.1" VIEWABLE 1280 X 1024 (BLACK)			$999
VIVP181	LCD MONITOR 18.1" VIEWABLE 1280 X 1024			$1499

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Western Digital www.wdc.com

MODEL#	CAP.(GB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
WD200BB	20.0	9 MS/7200	2048K	3.5"/1"H	$76
WD400AB	40.0	8.5MS/5400	2048K	3.5"/1"H	$78
WD300BB	30.0	9 MS/7200	2048K	3.5"/1"H	$83
WD400BB	40.0	9 MS/7200	2048K	3.5"/1"H	$93
WD600AB	60.0	8.5MS/5400	2048K	3.5"/1"H	$101
WD600BB	60.0	9 MS/7200	2048K	3.5"/1"H	$116
WD800AB	80.0	8.5MS/5400	2048K	3.5"/1"H	$141
WD800BB	80.0	9 MS/7200	2048K	3.5"/1"H	$153
WD1000BB	100.0	9 MS/7200	2048K	3.5"/1"H	$207
WD1000BBSE	100.0	9 MS/7200	8192K	3.5"/1"H	$259
WD1200BB	120.0	9 MS/7200	2048K	3.5"/1"H	$214
WD1200JB	120.0	8.9 MS/7200	8192K	3.5"/1"H	$249

IBM. www.ibm.com

MODEL#	CAP.(GB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
IBM35L040	40.0	8.5MS/7200	2048K	3.5"/1"H	$91
IBM35L060	60.0	8.5MS/7200	2048K	3.5"/1"H	$111
IBM35L080	80.0	8.5MS/7200	2048K	3.5"/1"H	$177
IBM35L120	120.0	8.5MS/7200	2048K	3.5"/1"H	$294

Maxtor www.maxtor.com

MODEL#	CAP.(GB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
MAX20U133-72	20.0	9 MS/7200	2048K	3.5"/1"H	$74
MAX409-5400	40.9	9 MS/5400	2048K	3.5"/1"H	$78
MAX307-7200	30.7	9.5 MS/7200	2048K	3.5"/1"H	$81
MAX40U133-72	40.0	9 MS/7200	2048K	3.5"/1"H	$91
MAX614-7200	61.4	9.5 MS/7200	2048K	3.5"/1"H	$123
MAX60U133-72	60.0	9 MS/7200	2048K	3.5"/1"H	$119
MAX819-5400	81.9	9 MS/5400	2048K	3.5"/1"H	$129
MAX80U133-72	80.0	9 MS/7200	2048K	3.5"/1"H	$152
MAX120133-54	120.0	11 MS/5400	2048K	3.5"/1"H	$209
MAX160U133-54	160.0	9 MS/5400	2048K	3.5"/1"H	$274

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PRULTRA100TX2	ULTRA ATA100 TX2 PCI 4 HARD DRIVE	$26
PRULTRA100	ULTRA ATA100 PCI 4 HARD DRIVE	$36
PRFASTRAK100TX2	ULTRA ATA100 RAID TX2 PCI	$74
PRFASTRAK100	ULTRA ATA100 RAID PCI	$77
PRFASTRAK100LP	ULTRA ATA100 RAID LOW PROFILE PCI	$107

adaptec www.adaptec.com

AD29160OEM	ULTRA 160 PCI BUS MSTR 160MB/SEC OEM	$195
AD19160KIT	ULTRA 160 PCI BUS MSTR 160MB/SEC RETAIL	$222
AD29160KIT	ULTRA 160 PCI BUS MSTR 160MB/SEC RETAIL	$294
AD2100SKIT	ULTRA 160 PCI SCSI RAID 160MB/SEC 32MB	$447
AD3210SKIT	ULTRA 160 PCI SCSI RAID 160MB/SEC 32MB	$744
AD3410SKIT	ULTRA 160 PCI SCSI RAID 160MB/SEC 64MB	$1029

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Maxtor www.maxtor.com

MODEL#	CAP.(GB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
MAXKW018J2	18	4.5MS/10000	8192K	3.5"/1"H	$199
MAXKW018L2	18	4.5MS/10000	8192K	3.5"/1"H	$199
MAXKW036J4	36	4.5MS/10000	8192K	3.5"/1"H	$399
MAXKW036L4	36	4.5MS/10000	8192K	3.5"/1"H	$399
MAXKW073J8	73	4.5MS/10000	8192K	3.5"/1"H	$749
MAXKW073L8	73	4.5MS/10000	8192K	3.5"/1"H	$749

Seagate www.seagate.com

MODEL#	CAP.(GB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
ST39236LWV	9.2	5.8MS/7200	4096K	3.5"/1"H	$220
ST318417W	18.4	8.5MS/7200	2048K	3.5"/1"H	$162
ST318437LW	18.4	8.5MS/7200	2048K	3.5"/1"H	$162
ST318436LWV	18.4	5.8MS/7200	4096K	3.5"/1"H	$299
ST318406LW	18.4	5.2MS/10,000	4096K	3.5"/FH	$209
ST318406LC	18.4	5.2MS/10,000	4096K	3.5"/FH	$209
ST318452LW	18.4	3.6MS/15,000	8192K	3.5"/FH	$349
ST318452LC	18.4	3.6MS/15,000	8192K	3.5"/FH	$349
ST336737LW	36.7	8.5MS/7200	2048K	3.5"/1"H	$359
ST336737LC	36.7	8.5MS/7200	2048K	3.5"/1"H	$359
ST336706LW	36.7	5.4MS/10,000	4096K	3.5"/FH	$389
ST336704LWV	36.7	5.2MS/10,000	16000K	3.5"/FH	$569
ST373405LW	73.4	4.9MS/10,000	4096K	3.5"/FH	$787
ST373405LC	73.4	4.9MS/10,000	4096K	3.5"/FH	$787
ST373405LCV	73.4	4.9MS/10,000	16000K	3.5"/FH	$799
ST1181677LWV	181.6	7.4MS/7200	16000K	3.5"/1"H	$1479
ST1181677LCV	181.6	7.4MS/7200	16000K	3.5"/1"H	$1484

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MATG45032DDR	G450 32MB, DDR AGP OEM (DUAL)	$82
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ATIX2KPRO32A	EXPERT 2000PRO AGP OEM VER 32MB	$43
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ATIRAD720064A	RADEON 7200 AGP OEM 64MB DDR	$62
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ATIAIWRAD32A	ALL-IN-WOND RADEON AGP OEM 32MB	$149
ATIRAD850064A	RADEON 8500 AGP OEM 64MB TV&DVI	$179

ABIT www.abit-usa.com

ABGF2MX20032A	GEFORCE-2 MX200 AGP 32MB	$46
ABGF2T20032ATV	GEFORCE-2 T200 AGP 32MB W/TV	$51
ABGF2MX40064A	GEFORCE-2 MX400 AGP 64MB	$65
ABGF2MX40064T	GEFORCE-2 MX400 AGP 64MB W/TV	$71
ABTI200DVI	GEFORCE-3 TI200 DVI W/TV AGP 64MB	$179
ABGF3VIO	GEFORCE-3 350MHZ RAMDAC AGP 64MB	$247

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ASV7700P64A	GEFORCE-2 AGP 64MB DDR	$164
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ASV8200T2P64A	GEFORCE-3 PURE V8200T2 TI200 64MB	$181
ASV8200T2D64A	GEFORCE-3 DEL V8200T2 TI200 64MB	$215
ASV7700ULTP64	GEFORCE-2 AGP 64MB ULTRA PURE	$332
ASV8200T5P64A	GEFORCE-3 PURE V8200T5 TI500 64MB	$353
ASV8200T5D64A	GEFORCE-3 DEL V8200T5 TI500 64MB	$382

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CREATIVE www.creative.com

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CLSBLDBYOEM	SOUND BLSTR LIVE DOLBY 5.1 OEM	$32
CLSBA1394OEM	SOUND BLSTR AUDIGY 1394 OEM	$62
CLSBLDBYR	SOUND BLSTR LIVE DOLBY 5.1 RETAIL	$64
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CLSBAUDMP3+R	SOUND BLSTR AUDIGY MP3+ RETAIL	$91
CLSBAUDXGR	SOUND BLSTR AUDIGY XGAMER RETAIL	$91
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CLSBEXTIGY	SOUND BLSTR EXTIGY USB EXTERNAL	$139
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3COM. www.3com.com

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3C3594	56 KBPS DATA/14.4kbps FAX INT PCI V.90 OEM/VOICE	$24
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3C2974	56 KBPS DATA/14.4kbps FAX INT PCI V.90 OEM/VOICE	$37
3C2977	56 KBPS DATA/14.4kbps FAX INT PCI V.90 OEM/NON WIN	$43
3C2976	56 KBPS DATA/14.4kbps FAX INT PCI V.90 OEM/NON WIN	$52

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CLDI5655	56 KBPS DATA/14.4kbps FAX INT PCI V.90 VOICE	$25
CLDI5660	56 KBPS DATA/14.4kbps FAX INT PCI V.90 NON WIN	$25
CLDI5630	56 KBPS DATA/14.4kbps FAX INT PCI V.92	$25

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IOZIP250IDE	REMOVABLE DRIVE	250MB INT ZIP	IDE OEM	$67
IOZIP250USB	REMOVABLE DRIVE	250MB EXT ZIP	USB	$164
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1 Maximum data transfer rate dependent upon variables including particular modems with which you are communicating, telephone lines, communications software and communications protocols.
2 Pocket Streets for Microsoft® Windows® CE requires Windows® CE 2.0 or later. Hardware available separately.

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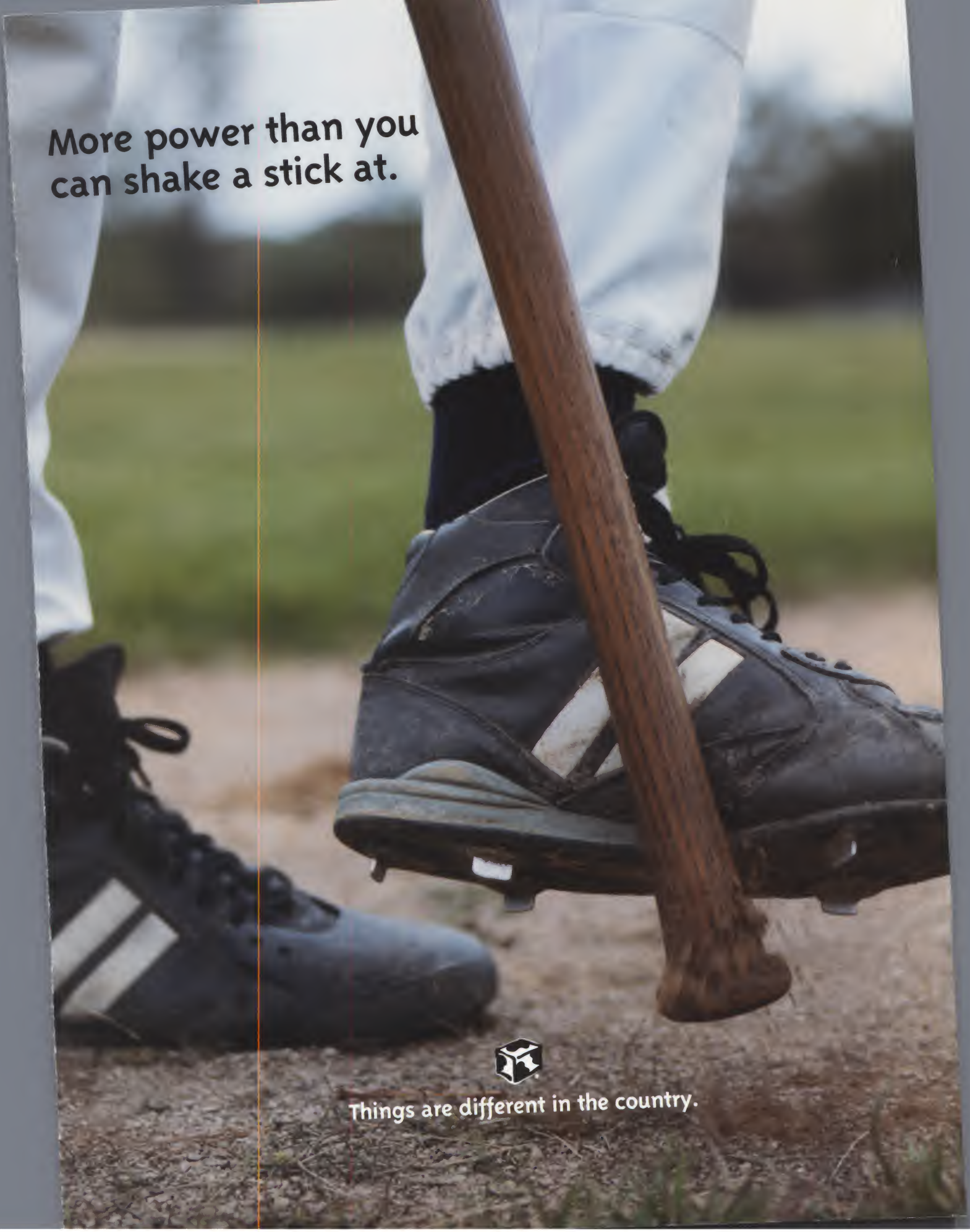
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ONLINE GAMING SITES *by Rick Broida*

Looking for a worthy gaming adversary? Then look online, where everyone from bridge players to armed-to-the-teeth mercenaries can find a game. Our list of 10 great gaming sites will help you find one that suits your taste.

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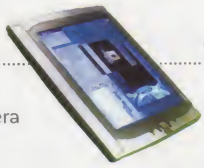

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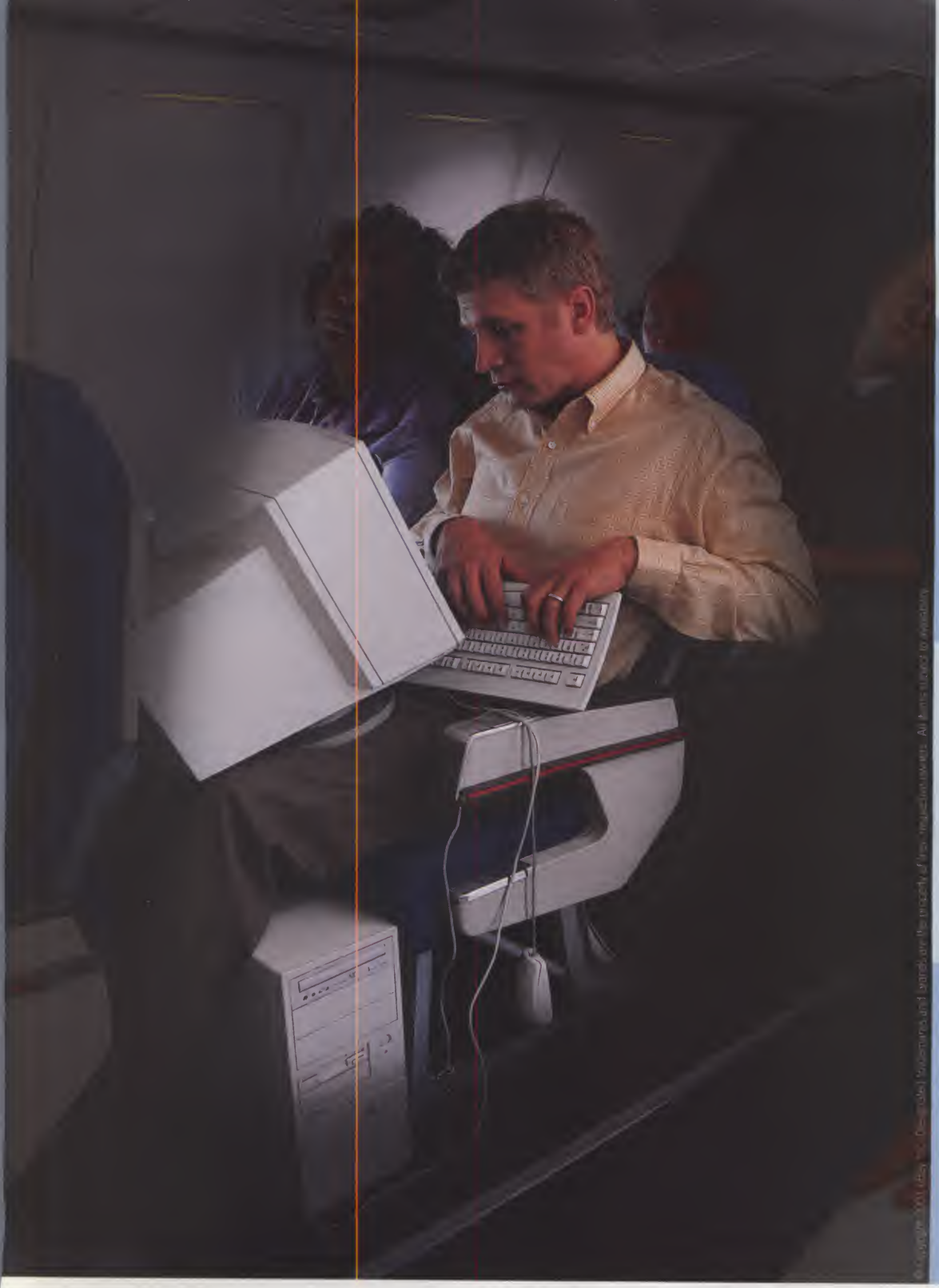

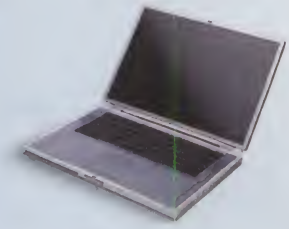

Titanium Notebook

Portable PC

Portable DVD Player

Electronic Organizer

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from the editor

JANICE CHEN

Speed Thrills

If you blew all your discretionary dollars on that dream vacation this summer, we've got good news: Your PC doesn't have to suffer. That's because lots of programs designed to boost its performance await you on the Web, and they're all available for free.

Of course, freeware has existed since the early days of personal computing, but today you can do more than ever with these downloads. You'll find the sites and tools you need in our cover story, "Fine-Tune Your PC for Free," on p. 136. Think of these apps as digital grease monkeys that assist in tasks like under-the-hood tinkering with the Windows Registry or tweaking system-memory settings to achieve over-the-top performance. Those more interested in the entertaining side of computing will go for media players and CD-burning apps, while pragmatic types will click toward downloads that compress files, scan for viruses, and optimize Net connections.

If you prefer a new, turbocharged PC that needs no adjustments (for now, at least), check out our roundup of 1.7GHz Pentium 4 powerhouses. In "Built for Speed" (p. 98), we test-drive five racers outfitted with Intel's fastest engine and find that it's not just the processor that fuels these PCs' performance: Each is loaded with fast memory, a roomy hard drive, and a blazing graphics card. Of course, you'll have to open your wallet pretty wide for the thrill of sitting behind the speediest Pentium 4 on the road; the sticker prices on these models range from $2,199 to $3,499.

Speed also has become a defining characteristic of CD-RW drives, which now deliver unprecedented read and write performance at prices as low as $149. In "The Fast Burn" (p. 110), we put a stopwatch to five of the latest internal CD burners. Besides faster write rates, we also found that CD-RW drives have become increasingly easy to use—you'll be cranking out fewer shiny coasters—and more affordable. If you're still spinning slowly with a first-generation CD-RW drive, or if you haven't yet experienced your first burn, some great choices await you.

Alpha geeks who have done it all may not need the help of our Shopper's Guide to upgrading a motherboard, but most anyone else will. After all, there's no better, albeit more daunting, way to jump-start an elderly PC's performance than by replacing the motherboard and dropping in a new CPU. In "Updating the Big Board" (p. 118), we provide step-by-step advice on how to buy the right motherboard, whether you're building from scratch or upgrading the PC you bought last year. Either way, you'll need to know the ins and outs of processors, form factors, chipsets, and memory technologies—all before you even begin considering which board is the right choice. Our guide won't leave you guessing.

By the time you snap the chassis back in place, chances are you—and your system—will be ready for a little fun, so turn to p. 142 and read "Get Your Game On(line)." Then fire up your rejuvenated PC and surf to some of the Web's most popular interactive gaming sites. We played around with dozens of these sites to uncover the 10 we consider the best. Whether you're attracted to the addictive action of EverQuest or prefer the more mellow pace of classics such as checkers, just name your game and get online. You don't even need a fast PC for most digital diversions.

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FEEDBACK FORUM

EXHILARATED BY X-10

Your Tune-Up feature on X-10 home-automation devices ("Lights Out," June, p. 198) was a real eye-opener. I always assumed computer automation required a computer to be left running 24/7. The versatility these inexpensive X-10 devices offer is nothing short of amazing—not to mention the convenience, safety, and energy savings. As a bonus, the X-10 remote I use is the first replacement device I've found that controls my television's picture-in-picture feature. If I had to choose between keeping my PC or my X-10 system, the computer would be history (after programming the X-10 system, of course).

KARY L. KRISMER

UNFAIR TO COMPARE

I take exception to Sheldon Leemon's article "Putting the Pieces Together (for Savings)" (July, p. 138), along with editor in chief Janice Chen's remarks ("Build Your Own and Save," p. 14). I don't disagree with the statements in the article, just the bottom-line figures. First of all, individuals *cannot* construct a PC from scratch for less than they'd pay for a complete system such as a Dell or a Gateway. If one uses parts from a previous PC (case, power supply, hard drive), the comparison immediately becomes apples and oranges. Dell and Gateway use all new parts; it isn't fair to compare those machines with a partially used PC. There's also the time factor. I'm sure Mr. Leemon spent more than just a couple of minutes obtaining components and constructing the PC. This isn't reflected in his bottom line, but it certainly is for Dell and Gateway.

PUTTING THE PIECES TOGETHER
{for savings}
BY SHELDON LEEMON
If you want to build your own PC, you can save hundreds of dollars by shopping around for components.

I've been "putting the pieces together" for many years. The experience has been worthwhile, but I certainly didn't save any money. If a person wants to sacrifice the time, put up with multiple warranties rather than just one, and forfeit the benefit of proper test equipment when things don't work, give construction a try. But don't expect to save money.

OLIVER "BUD" WARDLOW

EVEN BETTER DEALS

I enjoyed Sheldon Leemon's article "Putting the Pieces Together (for Savings)," but I think you could have done better—and stayed closer to home doing it. The deals you put together from promotions, Usenet ads, coupons, and rebates were good, but last month I put together a much better system for less money, and I did it using deals I found almost exclusively on your own computershopper.com. You paid nearly $80 for 256MB of PC133 SDRAM. I paid just over $99 for 512MB. The system I built was a 1.2GHz Athlon, but it took me less than five minutes to beat the prices you quote for both motherboard/CPU combos you listed. The deals you put together were good, but if you know what you're looking for, and use computershopper.com as a search engine, you can do even better.

CRAIG WILSON

CORRECTIONS

Due to an editing error in our review of Adobe Acrobat 5.0 (August, p. 94), we misidentified the product as Adobe Acrobat Reader 5.0.

Also, the art credit on p. 244 should have read, "Cartoon by Mike Shapiro."

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PC World Top 10 Value PC -August 2001
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PC World Top 15 Home PC -July 2001
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Computer Buyer's Guide Best Buy -March 2001
"ABS™ has done the impossible...the ABS™ Multimedia System 1 is an absolute steal..."

Best Buy Award -Aug 2000 Computer Shopper
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"ABS™ has done an outstanding job of building its Performance Alpha System."

Computer Buyer's Guide Best Buy -Feb 2000
"The 3D1-GS is a capable system. It is ideal for both home and SOHO users."

Cnet Editor's Choice -Jan 2000
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Can Scott Adams Save E-Books?

When horrormeister Stephen King abandoned his e-publishing effort last year, some predicted a gruesome future for the paperless book. Now, the e-book model has a new high-profile advocate: Scott Adams. The creator of the *Dilbert* comic strip is selling his new book exclusively in electronic form.

According to Adams, the book, titled *God's Debris* and available at ***www.dilbert.com*** for $4.95, was downloaded 1,800 times in just 12 days. Adams says he opted to take the e-book route because the book doesn't fit into traditional categories—he calls it "a thought experiment wrapped in a fictional story." The author also likes the e-book format because he can sell the book at a reasonable price without much promotion.

E-books have been slow to catch on, but major publishers are still betting on the medium. **Random House, AOL Time Warner,** and **Simon & Schuster** all offer e-books, and while it won't reveal exact sales numbers, **Barnes & Noble.com** says it has seen steady growth in its e-book sales and expects that expansion to continue.

Many analysts, however, believe e-books are rife with problems, including high costs, limited selection, and poor consumer awareness.

Read Scott Adams' latest musings away from the office.

IDC predicts e-book device sales will hit a paltry 153,000 worldwide in 2001, and Forrester Research says e-books will bring in just $251 million in revenues by 2005, compared with $7.8 billion in revenues for digital textbooks. A May study by The NPD Group found that one out of two online users are interested in the concept of e-books, but 77 percent are not likely to purchase one.

While Adams says he has never read an e-book, he has shopped for them online. "I just never found one I wanted to read," he says. "However, I also walk out of my local Barnes & Noble bookstore without finding anything I want to read 90 percent of the time. I will certainly be reading e-books when the selection gets larger, probably by PDA when I'm away from the house and waiting for something." —*Elaine X. Grant*

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Deathmatch Among Gaming Consoles

War is common in video games, but this year's real battle is between **Microsoft, Sony,** and **Nintendo,** which are introducing consoles that aim to transform the landscape of gaming by combining ultrapowerful graphics processors with DVD players and Internet access.

Microsoft's Xbox

Microsoft's $299 Xbox, available November 8, will incorporate a 733MHz Pentium processor and an 8GB hard drive. Its integrated DVD player won't play videos unless you buy the DVD-playback kit, which includes a remote control. Although Microsoft does not plan to offer built-in Web surfing or e-mail capabilities, it has enlisted 27 software makers to design games capable of working with Xbox's built-in broadband Internet access.

Sony's $299 PlayStation 2 integrates a DVD player, but Sony lets you watch movies right out of the box. Internet access won't be available until November, but the company has already announced partnerships with AOL and RealNetworks to integrate instant messaging, streaming music, and other features. In addition, AOL and Sony are developing a Netscape-branded Web browser, and Sony plans to release an external hard drive for the PlayStation 2 later this year.

Nintendo's $199 GameCube goes on sale two days before the Xbox, but it won't offer DVD-video playback or Internet access. (Broadband and 56kbps adapters eventually will be available.) The GameCube will be able to handle more complex games than previous Nintendo units, thanks to its faster IBM-designed processor.

It's anybody's guess who will win the console wars. Peter Tyson, a games analyst at Datamonitor, believes that several factors may leave Microsoft lagging. Nintendo's GameCube will cost $100 less than the Xbox, and both Nintendo and Sony offer a variety of games and a large installed user base.

—*Adam Fisher*

NET NOW

Rising DSL Prices: The Cost of Doing Business?

ILLUSTRATION BY BEK SHAKIROV

While high-speed Internet access promises to take the wait out of Web surfing, factors such as widespread unavailability, installation headaches, and company closings have threatened to derail its deployment.

Add one more potential hurdle: rising costs.

Recently, DSL providers such as **EarthLink** and **SBC Communications** have quietly raised their rates, making the average cost of service close to $50 per month—a $10 rate hike for most customers.

The price increase isn't a complete surprise, says Brad Baldwin, director of broadband technologies for research firm IDC. "[DSL companies] are finding that they can't make enough money on the fees they were charging," he says. Many in the industry, he adds, believe that prices were too low to start with.

Baldwin may have a point, considering that several DSL companies are struggling financially and some have even closed their doors, including **NorthPoint Communications. AT&T** bought NorthPoint's remaining assets in March.

Even if the industry chalks up the price hike to the growing cost of doing business, the bigger question is whether consumers will be less inclined to upgrade to high-speed service.

"We don't see a $10 increase as having an effect on the rollout of DSL," Baldwin says. "For many subscribers, DSL still represents a great value." In fact, IDC expects the number of worldwide DSL subscribers to jump from 4.5 million in 2000 to 66.4 million by the end of 2004.

Perhaps the biggest reason the price jump won't faze a lot of customers is that DSL providers aren't alone in raising rates. Cable Internet service providers, including AT&T, are also raising high-speed charges, and some analysts believe the recent hike by **America Online** from $21.95 to $23.90 will lead to price increases among dial-up Internet providers as well.

—Tamara Holmes

A Spicy Device for Seniors

Meet Ginger. No, not the sultry movie star from *Gilligan's Island*—this Ginger's got the looks, but she's more reminiscent of Mary Ann, the sweet, helpful, overly friendly castaway.

With seniors in mind, **Ginger Interactive** ***(www.gingerinteractive.com)*** hopes to buck the downward trend in Internet-appliance sales and hit the sweet spot between underpowered Web devices and too-complicated PCs. And it aims to do so with Ginger, an interactive voice- and touch-screen-activated "personal kiosk."

"We're trying to bridge the gap between Web appliances that don't deliver and PCs that are bulky and intimidating to the elderly," says Gary German, chief executive of Ginger Interactive. "Ginger talks with them, making them feel totally at ease, and they love it."

Forging full computing power with a nonthreatening interface, the company says Ginger requires virtually no training and can be used with the touch screen only, or with a mouse and keyboard. The $1,295 12-by-12-inch unit looks more like an ATM than a computer, but it packs a 500MHz Celeron processor, 128MB of RAM, a 10GB hard drive, and a 40x CD-ROM drive. At a svelte 7 pounds and a waiflike 4 inches thick, she's small enough to take anywhere.

Ginger

Who knows, with a few coconuts and the optional GPS capabilities, maybe Ginger might have been just what the Professor needed to finally get the gang off the island.

—Wendy Sheehan

SNIPING AT AUCTIONS

If you've lost that must-have online-auction item to a last-minute—or last-second—bidder, you know the frustration of being "sniped." Such late bids can be routinely achieved only through the use of third-party software. But some in the online-auction community believe that these tools have more impact on the auction industry than on individual bidders.

Whit Andrews, research director for Gartner, believes that software such as AuctionStealer, iSnipeIt, and TurboBid do not affect bidding prices. Instead, he says, sniping tools play a different role, providing information to third-party companies about what bidders will pay. Data on bid limits gives sites such as **eBay** insight into pricing tolerance, which may influence business operations and revenue projections.

Will a sniper snag the flying pig you've got your eye on?

But what about individual users? Ken Knull, secretary of the board of directors of the **Online Auction Users Association,** says sniping tools don't drive up auction prices. "With most sniping tools, you enter a maximum bid that isn't placed until the last possible second, so there's no time to react if someone outbids you," he explains. "[If the bidders] go past what I've entered as my top bid, my snipe is going to be ineffective anyway."

—Gwen Moran

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NET NOW

A Taxing Question

To tax or not to tax Internet sales? That's the question—but don't expect an answer anytime soon.

The 1998 enactment of the Internet Tax Freedom Act (ITFA) established a temporary Net-tax moratorium, which expires in October. While the anti-tax Bush administration has been quiet on the issue, a number of bills, both for and against Internet sales taxes, have since been introduced on Capitol Hill.

One such bill is Cox-Wyden IV, sponsored by Sen. Ron Wyden (D-Ore.) and Rep. Christopher Cox (R-Calif.), which extends the moratorium by five years and proposes streamlining tax-collection processes. The status of the proposed bill changes every day as negotiations continue, says Wyden spokeswoman Carol Guthrie.

David Brunori, an Arlington, Va.-based tax attorney and contributing editor to *State Tax Notes* magazine, says state governments fear this measure would infringe on their taxing authority. While off-the-shelf software packages are available to track varying rates in the approximately 7,500 sales-tax jurisdictions in the United States, one major challenge for businesses will be to track which products and services are taxable in each region.

PHOTOGRAPH BY BILL MILNE

Brunori's guess is that sales tax will eventually be a fact of life for e-businesses. "I believe that what we'll end up with is some kind of agreement in which a lot of Internet and mail-order sales will be taxed, collected by the vendor, remitted to the state, and streamlined to be made as painless as possible." —*Gwen Moran*

Classified Information

What's black and white and read all over? **eBay** hopes the answer is newspaper classifieds, which it began placing in the Minneapolis *Star Tribune* and the *St. Petersburg Times* in May.

Called eBay Seller Classifieds, the ads enable eBay sellers to advertise their online auctions, including product information, item number, and starting bid price, in a dedicated part of the classified section for an introductory price of $6 per week. Interested readers then log on to eBay to bid.

Lanny Baker, an analyst with Salomon Smith Barney, approves of eBay's moves. "[eBay has rolled out] overlapping and interlocked initiatives to grow its user base and geographic reach," he says. These initiatives include the new classifieds feature.

The concept isn't new. According to eBay spokesman Kevin Pursglove, the online auction site first hatched the idea three years ago. eBay won't specify why it chose these two papers, but Pursglove says the company talked with a handful of newspapers in an attempt to find one in a region where eBay is well-known, and one that would allow eBay to test the idea for an extended period. The company plans to expand the feature to other newspapers if the trial is successful.

eBay isn't the only Web retailer to turn to traditional methods of advertising. **Amazon.com** has been publishing advertising circulars in the Sunday *New York Times* for about a year, an initiative that spokeswoman Carrie Peters says has met with considerable success. —*Elaine X. Grant*

Need to find a product online? Check the newspaper.

You've Got Braille!

With more than 1 million visually impaired people in the United States, a growing niche of assistive-technology products is cropping up for the blind.

"A greater percentage of the computer population is beginning to realize that computers are something blind people can use with facility," says Curtis Chong, director of technology for the **National Federation of the Blind.** He says text-to-speech products that read to users are the most common among the visually impaired, because they are less expensive than Braille displays.

The most popular screen reader, **Henter-Joyce's** $795 JAWS for Windows, reads text from common Windows applications such as Microsoft Word and Excel, and Quicken. The less costly $49.99 iSpeak 2.0 from **Fonix** reads text in a natural-sounding voice, and allows you to save e-mail and other documents as MP3 files.

In addition to text-to-speech software, the growing market of products for the blind includes **Pulse Data International's** BrailleNote, a Windows CE-based device with a Braille keyboard that also provides synthesized speech. The BrailleNote costs $3,799 with an 18-cell display and $5,499 with a 32-cell display.

For those who want to experience nontextual aspects of the Web, **VirTouch** offers the $4,900 Virtual Touch System mouse, which lets you read Braille and feel the shape of graphics displayed onscreen.

—*Brian T. Horowitz*

Pulse Data BrailleNote

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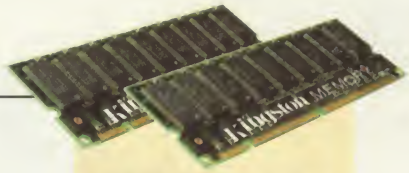

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STOP THE INSANITY—AND THE JUNK MAIL

If your real-world mailbox is overflowing with catalogs, credit-card offers, and other straight-to-the-garbage clutter, **Stopthejunkmail.com** ***(www.stopthejunkmail.com)*** can help stem the tide of trash. For a $10 annual fee, the site will send a legal notice to each junk-mailer that you select, requiring that company to remove you from its mailing list.

In most cases, you can delete yourself from mailing lists for free—if you've got the time to call or write to a company and request removal. "Most people get seven to 15 pieces of junk mail a day, so to call or write each of them is an enormous burden," says Michael Kranitz, president of Stopthejunkmail.com. "The site allows them to do in minutes what it would take hours to do."

Although Stopthejunkmail.com can contact more than 4,000 catalog companies on your behalf, the site can't help if a catalog isn't on its list, and many are not.

Still, the service can be worthwhile, says Jason Catlett, president of **Junkbusters** ***(www.junkbusters.com)***, a privacy advocacy organization. "I'm generally in favor of anything that lessens the massive burden of junk that's dumped continuously onto Americans," he says. "Personally, I grind my teeth at the idea of paying for peace, quiet, and privacy, but many people consider it well worth a few dollars."

To help defray the deforestation caused by all that junk mail, a portion of each membership fee goes to help the **American Forests Organization** ***(www.americanforests.org)*** plant a tree in North America. Stopthejunkmail.com has made donations to plant 500 trees and hopes to help plant 90,000 more by year's end. —*Kevin Savetz*

Send Instant Gratification

Want to send a gift to someone you've never met? It's easy, if you use the **Odigo** instant-messaging (IM) platform. Odigo ***(www.odigo.com)*** now allows users to send gifts using just an IM screen name.

After downloading the Instant Gift plug-in from the Odigo site, the sender selects an IM address and chooses a gift from the catalog. Odigo sends a message to the recipient asking if that person wants to accept the gift. If the answer is yes, Odigo gathers the required information and sends the present, but doesn't share the shipping information with the sender.

Odigo goes from buddy list to gift list.

"The immediacy of being able to target someone on your buddy list and send them anything from a $10 box of cookies to a $60 flower arrangement is a unique quality," says Alex Diamandis, vice president of sales and marketing at Odigo. Diamandis says IM users can have from 10 to 100 people on their buddy lists, and Instant Gifts saves them the trouble of looking up addresses.

"A lot of matchmaking and flirtation goes on through IM," he says, noting that the service gives users a safe way to send that special something to that special, if anonymous, someone.

Others doubt the viability of the concept. "I don't think there will be a great deal of faith in the promise of anonymity," says Robert Mahowald, a senior analyst at IDC. "Only those who truly don't care who gets their home address will go ahead and give it out." —*Elaine X. Grant*

VALUE LINE DIGITAL CAMERAS

A sampling of digital snapshooters found on computershopper.com

Fujifilm MX-1200 **$249**
1.3 megapixels, 8MB SmartMedia card, 1,280-by-960 resolution, does not accept additional lenses, serial interface, 1.4 pounds

Olympus Camedia C-2040 Zoom **$369**
2.1 megapixels, 8MB SmartMedia card, 1,600-by-1,200 resolution, video capture, accepts additional lenses, USB interface, 10.9 ounces

Nikon Coolpix 990 **$769**
3.3 megapixels, 16MB CompactFlash card (Type I), 2,048-by-1,536 resolution, video capture, accepts additional lenses, USB and serial interfaces, 1.2 pounds

Canon PowerShot Pro90 IS **$805**
2.6 megapixels, 16MB CompactFlash card (Type I or II), 1,856-by-1,392 resolution, video capture, accepts additional lenses, USB interface, 1.5 pounds

$250 | $500 | $750 | $1,000

Kodak DC280 **$339**
2 megapixels, 8MB CompactFlash card (Type I), 1,760-by-1,168 resolution, accepts additional lenses, USB and serial interfaces, 1 pound

Sony Cyber-shot DSC-P1 **$579**
3.3 megapixels, 8MB Memory Stick, 2,048-by-1,536 resolution, video capture, does not accept additional lenses, USB interface, 8.8 ounces

Epson PhotoPC 3000Z **$782**
3.3 megapixels, 16MB CompactFlash card (Type I), 2,048-by-1,536 resolution, video capture, accepts additional lenses, USB and serial interfaces, 1.2 pounds

Olympus Camedia C-2040 Zoom

Source: computershopper.com, June 8, 2001

ILLUSTRATION BY BEK SHAKIROV

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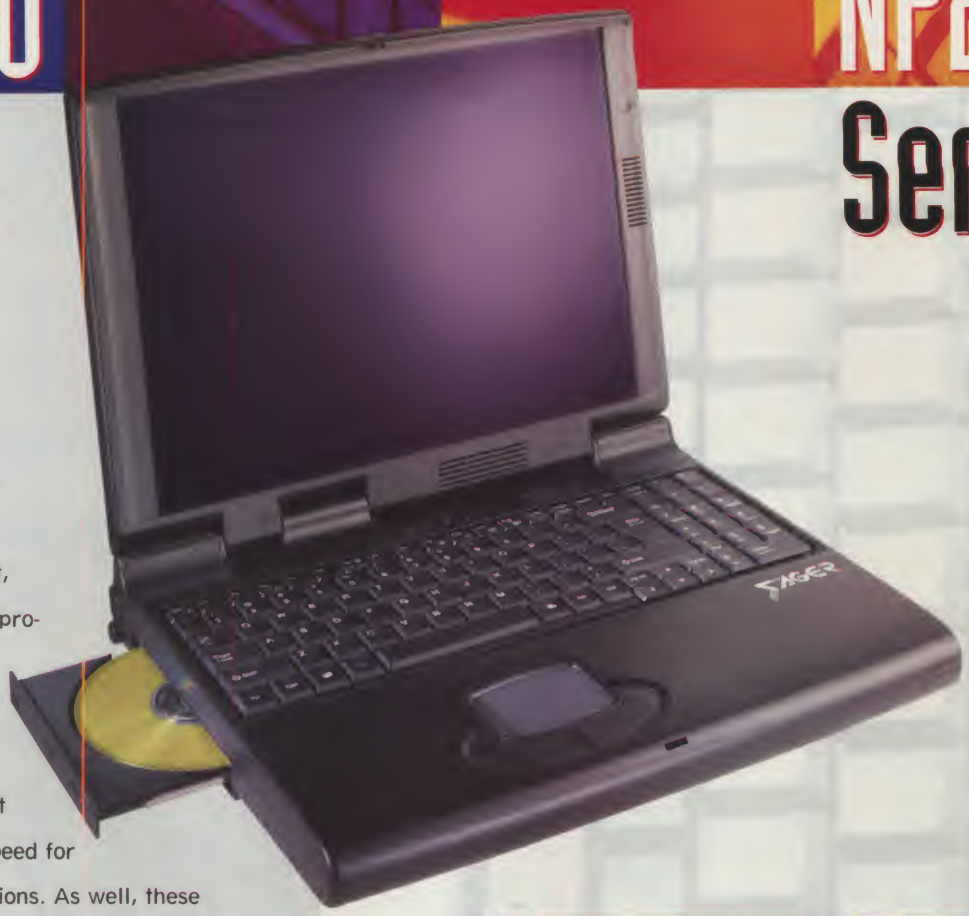
NP8560 Series

NP2850 Series



Sager's NP8560 Desktop Replacement comes loaded with the latest, cutting-edge technology in processing for a notebook. This new capability increases bandwidth from 100MHz to 133MHz and that translates into ultra-fast speed for memory intensive applications. As well, these notebooks come complete with upgraded features normally found only in a desktop computer including a huge 15.0" SXGA+ Active Matrix Display. Upgrade to the NP8560 Series for tomorrow's portable speed, built for you today.

Sager presents the ultimate notebook for viewing and graphics, under 7.1 pounds and only 1.5" thin! The NP2850 Series offers speed and agility for handling demanding graphics applications normally found only in a desktop. With a 15.0" XGA Active Matrix Display, you can't ask for better viewing size or capability in a portable computer. As for graphics, the NP2850 Series comes complete with a 2X AGP Chipset and a 3D Graphics Accelerator for blazing speed.

np 8560 v

- 15.0" SXGA+ Active Matrix Display
- Intel® Pentium® III Processor 1.0GHz
- 16MB Video Memory
- 256MB 133MHz SDRAM
- 30.0GB Ultra DMA Hard Drive
- Modular 8X Max. DVD-ROM[2] and 4X4X20 Max. CD-RW Drive[3](both included)
- Integrated 56K V90 Modem[4] + 10/100 Ethernet
- 15-Cell 75.6w Smart Lithium-Ion Battery
- 102-Key Keyboard with Numeric Keypad
- IEEE-1394 Port
- 256KB On-Die L2 Cache
- Modular 3.5" FDD exchangeable with opt. Iomega® Zip Drive or 2nd HDD
- 3D Surround Sound with Hardware Wavetable
- Built-In Touchpad Pointing Device
- 2 Type II or 1 Type III PCMCIA Slots
- Infra Red, Wireless Fast IR Interface
- 1 TV-Out Port & 1 Video-In Port
- Other Ports: 2 USB, 1S, 1P, Ext. Keyboard and Ext. CRT
- Microsoft® Windows® ME
- Deluxe Carrying Case
- Weight: 9.5 lbs with Battery
- 14.0"w x 11.0"d x 2.2"h
- Sager's Umbrella Protection Policy

$2245

np 8560 s

- 15.0" SXGA+ Active Matrix Display
- Intel® Pentium® III Processor 1.0GHz
- 16MB Video Memory
- 256MB 133MHz SDRAM
- 20.0GB Ultra DMA Hard Drive
- 8X Max. DVD-ROM Drive[2]
- Integrated 56K V90 Modem[4] + 10/100 Ethernet
- 15-Cell 75.6w Smart Lithium-Ion Battery
- 102-Key Keyboard with Numeric Keypad
- IEEE-1394 Port
- 256KB On-Die L2 Cache
- Modular 3.5" FDD exchangeable with opt. Iomega® Zip Drive or 2nd HDD
- 3D Surround Sound with Hardware Wavetable
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- 1 TV-Out Port & 1 Video-In Port
- Other Ports: 2 USB, 1S, 1P, Ext. Keyboard and Ext. CRT
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- Deluxe Carrying Case
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- Sager's Umbrella Protection Policy

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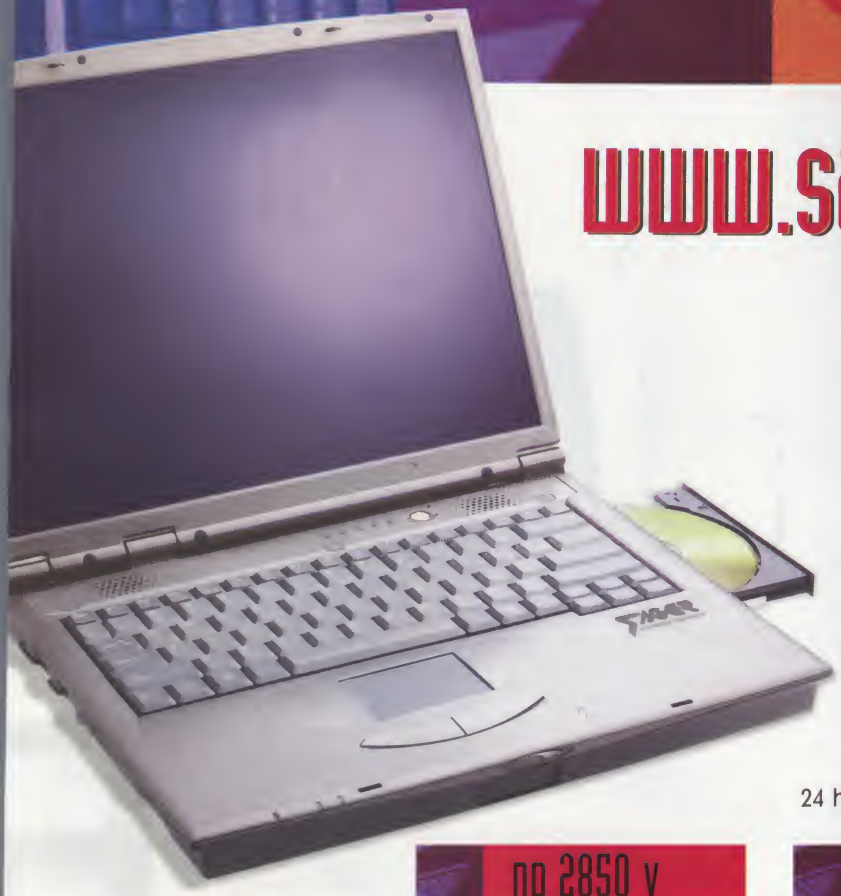

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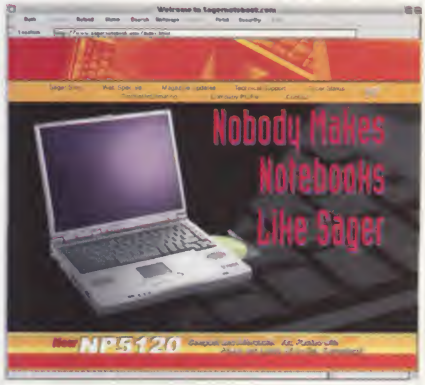

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- Intel® Pentium® III Processor 900MHz
- 16MB Video Memory
- 128MB 133MHz SDRAM
- 10.0GB Ultra DMA Hard Drive
- 24X Max. CD-ROM Drive[1]
- Integrated 56K V90 Modem[4] + 10/100 Ethernet
- 15-Cell 75.6w Smart Lithium-Ion Battery
- 102-Key Keyboard with Numeric Keypad
- IEEE-1394 Port
- 256KB On-Die L2 Cache
- Modular 3.5" FDD exchangeable with opt. Iomega® Zip Drive or 2nd HDD
- 3D Surround Sound with Hardware Wavetable
- Built-In Touchpad Pointing Device
- 2 Type II or 1 Type III PCMCIA Slots
- Infra Red, Wireless Fast IR Interface
- 1 TV-Out Port & 1 Video-In Port
- Other Ports: 2 USB, 1S, 1P, Ext. Keyboard and Ext. CRT
- Microsoft® Windows® ME
- Deluxe Carrying Case
- Weight: 9.5 lbs with Battery
- 14.0"w x 11.0"d x 2.2"h
- Sager's Umbrella Protection Policy

$1795

np 2850 v

- 15.0" XGA Active Matrix Display
- Mobile Pentium® III Processor 800MHz Featuring Intel® SpeedStep™ Technology
- 256MB SDRAM
- 30.0GB Ultra DMA Hard Drive
- 8X Max. DVD-ROM Drive[2]
- Integrated 10/100 Ethernet
- Thin (1.49") and Lightweight (7.1 lbs)
- 256KB On-Die L2 Cache
- 2X AGP 8MB ATI Rage Pro 3D Video
- 3.5" 1.44MB Floppy Disk Drive
- 3D Surround Sound
- Smart Lithium-Ion Battery
- Built-In Touchpad Pointing Device
- 1 Type II PCMCIA Slot
- Infra Red, Wireless Fast IR Interface
- 2 USB Ports
- Other Ports: 1S, 1P, Ext. Keyboard and Ext. CRT
- A4 Size Windows® 95 Keyboard
- Microsoft® Windows® ME
- Deluxe Carrying Case
- 12.8"w x 10.51"d x 1.49"h
- Sager's Umbrella Protection Policy

$1945

np 2850 s

- 15.0" XGA Active Matrix Display
- Mobile Pentium® III Processor 800MHz Featuring Intel® SpeedStep™ Technology
- 128MB 100MHz SDRAM
- 20.0GB Ultra DMA Hard Drive
- 8X Max. DVD-ROM Drive[2]
- Integrated 10/100 Ethernet
- Thin (1.49") and Lightweight (7.1 lbs)
- 256KB On-Die L2 Cache
- 2X AGP 8MB ATI Rage Pro 3D Video
- 3.5" 1.44MB Floppy Disk Drive
- 3D Surround Sound
- Smart Lithium-Ion Battery
- Built-In Touchpad Pointing Device
- 1 Type II PCMCIA Slot
- Infra Red, Wireless Fast IR Interface
- 2 USB Ports
- Other Ports: 1S, 1P, Ext. Keyboard and Ext. CRT
- A4 Size Windows® 95 Keyboard
- Microsoft® Windows® ME
- Deluxe Carrying Case
- 12.8"w x 10.51"d x 1.49"h
- Sager's Umbrella Protection Policy

$1795

np 2850 c

- 15.0" XGA Active Matrix Display
- Mobile Pentium® III Processor 650MHz Featuring Intel® SpeedStep™ Technology
- 128MB 100MHz SDRAM
- 10.0GB Ultra DMA Hard Drive
- 24X Max. CD-ROM Drive[1]
- Integrated 10/100 Ethernet
- Thin (1.49") and Lightweight (7.1 lbs)
- 128KB On-Die L2 Cache
- 2X AGP 8MB ATI Rage Pro 3D Video
- 3.5" 1.44MB Floppy Disk Drive
- 3D Surround Sound
- Smart Lithium-Ion Battery
- Built-In Touchpad Pointing Device
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- Infra Red, Wireless Fast IR Interface
- 2 USB Ports
- Other Ports: 1S, 1P, Ext. Keyboard and Ext. CRT
- A4 Size Windows® 95 Keyboard
- Microsoft® Windows® ME
- Deluxe Carrying Case
- 12.8"w x 10.51"d x 1.49"h
- Sager's Umbrella Protection Policy

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Options

- Car Adapter
- CD-RW Drive
- Iomega® Zip Drive (NP8560)
- Port Replicator
- Numeric Keypad
- USB Video-Camera
- Secondary Hard Disk Drive (NP8560)

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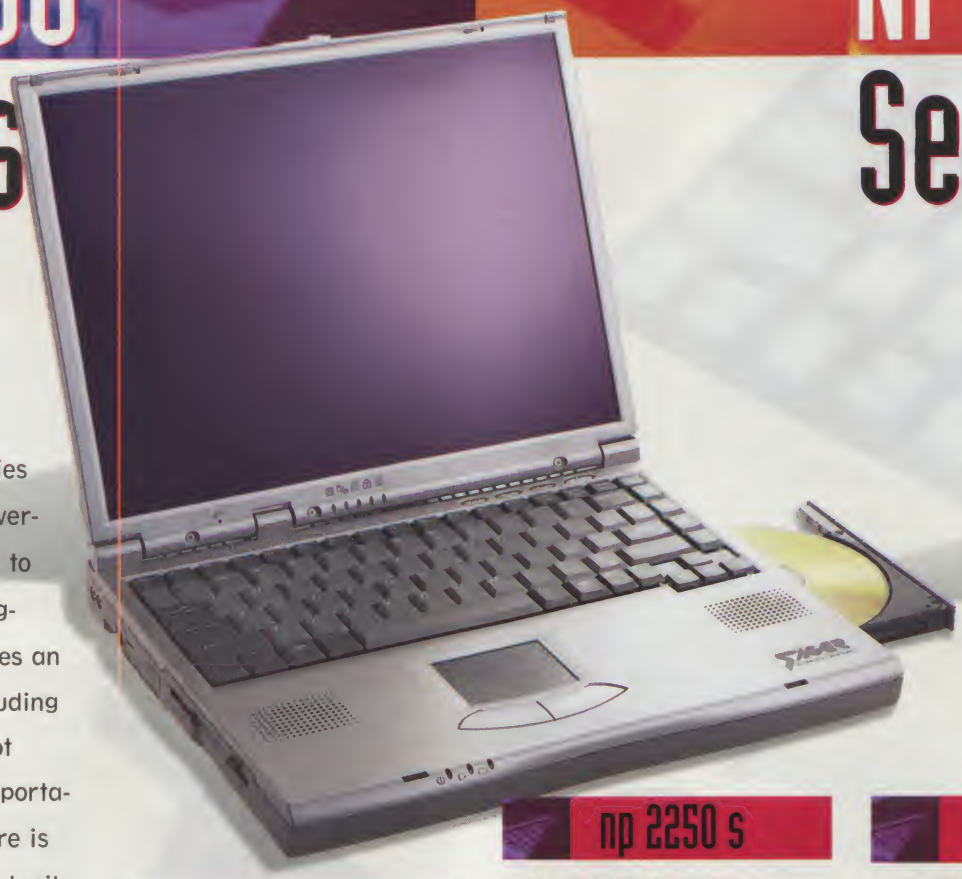
NP2250 Series

NP5120 Series



The new NP2250 Series from Sager is power-packed and ready to perform. This leading-edge notebook features an all-in-one design including advanced features not found in many other portables. All this and more is loaded into a beautiful, silver case measuring just 1.48" high. The NP2250 Series takes productivity and technology to the next level. With such a complete package, this is one solution you have to consider for any portable computing need.

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- 14.1" XGA Active Matrix Display
- Mobile Pentium® III Processor 800MHz
- Integrated 4X AGP Graphics with 32MB Max. User Definable Share Memory Architecture
- 128MB 100MHz SDRAM
- 20.0GB Ultra DMA Hard Drive
- 8X Max. DVD-ROM Drive[2]
- Integrated 56K V90 Modem[4] + 10/100 Ethernet
- 3 Hot-Keys for E-Mail, Browser and API
- 256KB On-Die L2 Cache
- 3.5" 1.44MB Floppy Disk Drive
- 3D Surround Sound
- Smart Lithium-Ion Battery
- Built-In Touchpad Pointing Device
- 1 Type II PCMCIA Slot
- Infra Red, Wireless Fast IR Interface
- 2 USB Ports
- Other Ports: 1S, 1P, Ext. Keyboard and Ext. CRT
- A4 Size Windows® 95 Keyboard
- Microsoft® Windows® ME
- Deluxe Carrying Case
- Weight: 7.0 lbs with Battery
- 12.1"w x 10.0"d x 1.48"h
- Sager's Umbrella Protection Policy

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np 2250 s

- 14.1" XGA Active Matrix Display
- Mobile Pentium® III Processor 650MHz
- Integrated 4X AGP Graphics with 32MB Max. User Definable Share Memory Architecture
- 128MB 100MHz SDRAM
- 10.0GB Ultra DMA Hard Drive
- 24X Max. CD-ROM Drive[1]
- Integrated 56K V90 Modem[4] + 10/100 Ethernet
- 3 Hot-Keys for E-Mail, Browser and API
- 256KB On-Die L2 Cache
- 3.5" 1.44MB Floppy Disk Drive
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- Smart Lithium-Ion Battery
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- Infra Red, Wireless Fast IR Interface
- 2 USB Ports
- Other Ports: 1S, 1P, Ext. Keyboard and Ext. CRT
- A4 Size Windows® 95 Keyboard
- Microsoft® Windows® ME
- Deluxe Carrying Case
- Weight: 7.0 lbs with Battery
- 12.1"w x 10.0"d x 1.48"h
- Sager's Umbrella Protection Policy

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np 2250 c

- 13.3" XGA Active Matrix Display
- Mobile Intel® Celeron™ Processor 550MHz
- Integrated 4X AGP Graphics with 32MB Max. User Definable Share Memory Architecture
- 128MB 100MHz SDRAM
- 10.0GB Ultra DMA Hard Drive
- 24X Max. CD-ROM Drive[1]
- Integrated 56K V90 Modem[4] + 10/100 Ethernet
- 3 Hot-Keys for E-Mail, Browser and API
- 128KB On-Die L2 Cache
- 3.5" 1.44MB Floppy Disk Drive
- 3D Surround Sound
- Smart Lithium-Ion Battery
- Built-In Touchpad Pointing Device
- 1 Type II PCMCIA Slot
- Infra Red, Wireless Fast IR Interface
- 2 USB Ports
- Other Ports: 1S, 1P, Ext. Keyboard and Ext. CRT
- A4 Size Windows® 95 Keyboard
- Microsoft® Windows® ME
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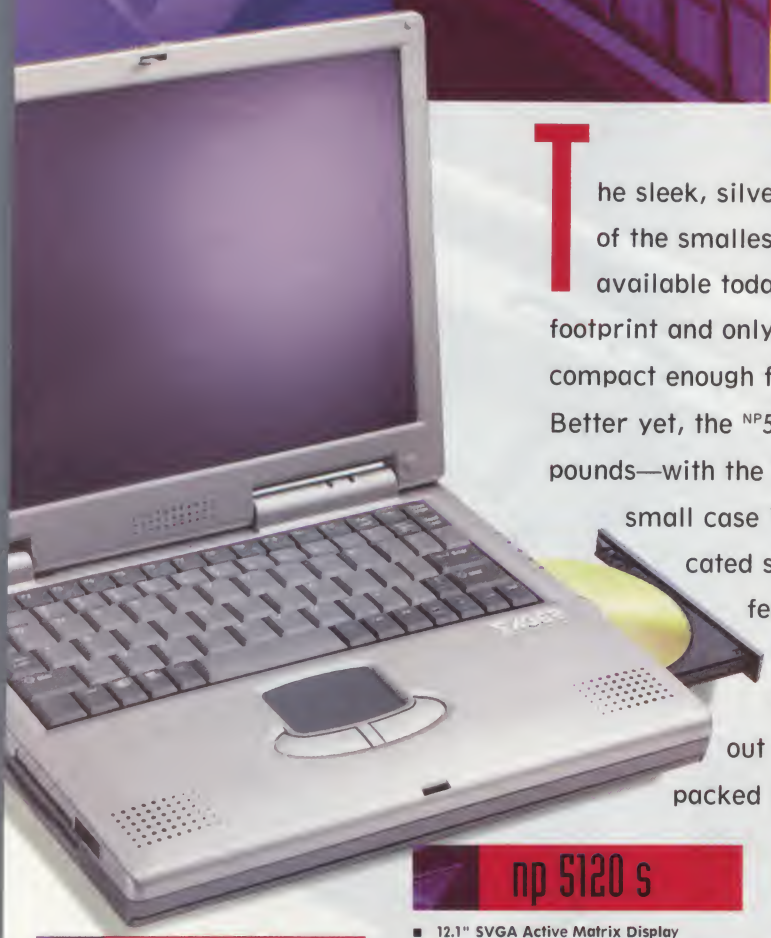

The sleek, silver-toned NP5120 Series is one of the smallest, yet powerful, notebooks available today. With an 11.0" x 9.4" footprint and only 1.6" high, this notebook is compact enough for demanding situations. Better yet, the NP5120 weighs in at only 6.6 pounds—with the battery! Packed into this small case is one of the most sophisticated systems available today featuring the latest technology for speed, graphics and performance. Check out the NP5120 Series power-packed configurations.

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- 12.1" SVGA Active Matrix Display
- Mobile Pentium® III Processor 800MHz
- 128MB SDRAM
- 20.0GB Ultra DMA Hard Drive
- 8X Max. DVD-ROM Drive[2]
- Integrated 56K V90 Modem[4] + 10/100 Ethernet
- The Smallest All-In-One Design
- 256KB On-Die L2 Cache
- Integrated 4X AGP Graphics with 32MB Max. User Definable Share Memory Architecture
- 3.5" 1.44MB Floppy Disk Drive
- 3D Surround Sound
- Smart Lithium-Ion Battery
- Built-In Touchpad Pointing Device
- 1 Type II PCMCIA Slot
- Infra Red, Wireless Fast IR Interface
- 1 Kensington Lock Port
- Other Ports: USB, 1S, 1P, Ext. Keyboard and Ext. CRT
- Windows® 95 Keyboard
- Microsoft® Windows® ME
- Deluxe Carrying Case
- Weight: 6.6 lbs with Battery
- 11.0"w x 9.4"d x 1.6"h
- Sager's Umbrella Protection Policy

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np 5120 s

- 12.1" SVGA Active Matrix Display
- Mobile Pentium® III Processor 650MHz
- 128MB SDRAM
- 10.0GB Ultra DMA Hard Drive
- 24X Max. CD-ROM Drive[2]
- Integrated 56K V90 Modem[4] + 10/100 Ethernet
- The Smallest All-In-One Design
- 256KB On-Die L2 Cache
- Integrated 4X AGP Graphics with 32MB Max. User Definable Share Memory Architecture
- 3.5" 1.44MB Floppy Disk Drive
- 3D Surround Sound
- Smart Lithium-Ion Battery
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- Microsoft® Windows® ME
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- Sager's Umbrella Protection Policy

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np 5120 c

- 12.1" SVGA Active Matrix Display
- Intel® Celeron™ Processor 500MHz
- 128MB SDRAM
- 10.0GB Ultra DMA Hard Drive
- 24X Max. CD-ROM Drive[1]
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- The Smallest All-In-One Design
- 128KB On-Die L2 Cache
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- 3.5" 1.44MB Floppy Disk Drive
- 3D Surround Sound
- Smart Lithium-Ion Battery
- Built-In Touchpad Pointing Device
- 1 Type II PCMCIA Slot
- Infra Red, Wireless Fast IR Interface
- 1 Kensington Lock Port
- Other Ports: USB, 1S, 1P, Ext. Keyboard and Ext. CRT
- Windows® 95 Keyboard
- Microsoft® Windows® ME
- Deluxe Carrying Case
- Weight: 6.6 lbs with Battery
- 11.0"w x 9.4"d x 1.6"h
- Sager's Umbrella Protection Policy

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Options

- Car Adapter
- CD-RW Drive
- Port Replicator
- Numeric Keypad
- USB Video-Camera

Sager's Umbrella Protection Policy

- 30-Day Money-Back Guarantee. If the equipment does not work as promised, or if you are not fully satisfied, we will issue a full refund upon the return of all original equipment.
- 48-Hour Repair Promise. For the first 30 days, we'll repair or replace your computer within 48 hours, and we'll pay the 2nd day air return shipping charge.
- 72-Hour Repair Promise. For the rest of the 1-year warranty period, if it takes more than 72-hours to repair your computer, we'll pay 2nd day air return shipping charge.
- 1-Year Parts and Labor Limited Warranty.
- Lifetime Toll-Free Technical Support.

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Notes: 1, 2, 3: CD-ROM, DVD-ROM, and CD-RW drives list a variable read rate. CD-RW write and re-write speeds vary and list only the maximum possible speed. Actual CD-ROM, DVD-ROM, CD-RW speeds will vary and are often less than the maximum possible speed. 4: Maximum Transmission speed of up to 53Kps when downloading and 33.6Kps when uploading data. Actual speeds may vary depending on line conditions and current FCC restrictions.

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intel inside pentium® III

Servers

7400 Server

With easy expandability, exceptional compatibility and the Intel Pentium III Processor, this solid system will meet the challenges of nearly any network environment.

- Intel Pentium III Processor 933MHz
- 133MHz Front Side Bus Support and 64-bit PCI I/O Technology
- 128MB of PC133 ECC SDRAM
- 9GB Ultra160 (10,000rpm) SCSI SCA Hard Drive
- 12 Bay Tower (5U Rack Option) with 7 PCI Expansion Slots
- Integrated Server Motherboard
- Dual 350W N+1, Redundant Hot-plug Power Supplies
- 3 Yr Parts & Labor Limited Warranty[2]
- FCC Class A Compliance[3]

$1599[4]

1. Maximum data transfer rate dependent upon variables including particular modems with which you are communicating, telephone lines, communications software and communications protocols.
2. Visit gateway.com, call 1-800-846-2000 or write to Gateway Terms & Conditions, P.O. Box 1951, North Sioux City, SD 57049-1951 for a free copy of applicable limited warranties and service agreements. Services may be provided by third parties. An authorized representative will determine the method of service provided. You may be required to take or send your product to an authorized location for service.
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Ad code: 006513

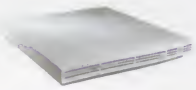
Service and Training

PC Support and Network Training

Core skills training provides a foundation for a stable networking environment.

Networking Solutions

Need help installing a new network or updating an existing one? Gateway can help. Because everyone's needs are different, a Gateway certified engineer will visit your site for free, assess your business needs and develop a solution with everything you need, nothing you don't. For everything from consulting and installation services to ongoing support, Gateway™ Networking Solutions is the comprehensive source for all your technology needs.



Network Attached Storage

Gateway™ GS 400 Model 140

Take network-attached storage to a new level of simplicity. Instantly add up to 240GB of storage without taking down the server or the network.

- Desktop unit; 1U rack option
- 40GB 7200 RPM EIDE front removable hard drive, expandable to four HDD
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- Browser-based Setup, Management, and Monitoring
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- Definable User Quotas
- User/Group Security, File Locking/Sharing, Security Integration
- 3 Yr Parts & Labor Limited Warranty[2]

$999[4]

Wireless Networking

Wireless Network RG-1000 Access Point

The RG-1000 is the hub of your wireless network, connecting users from anywhere in the office.

- Ideal for small office applications
- Built in radio-card (supports 20-30 users)
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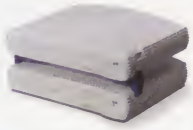
- Encryption to protect your data
- One ISP account used by multiple clients simultaneously
- Supports DHCP, PPP and NAT

$299[4]



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exhibits reality perfectly.

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EDITED BY BRIAN BENNETT

A Vroom With a View

ViewSonic ViewPad 100

What it is:
Finally, a sensible fusion of the PDA and PC. Look into the ViewPad 100's roomy 10-inch SVGA display, and you'll see an end to squinting at tiny PDA screens. The $1,099 ViewPad 100 measures 8.4 inches by 11.3 inches by 0.9 inch and weighs 2.5 pounds. It's outfitted with USB, CompactFlash, and PC Card connections that broaden its capabilities far beyond those of the typical handheld. And that could make highly mobile business professionals very happy. Or at least productive.

Take a closer look:
Under the hood, that is. You'll find a speedy 206MHz Intel StrongARM processor, 32MB of flash ROM, plus 64MB of SDRAM. And its instant-on Windows CE 3.0 operating system, handwriting recognition, and virtual keyboard deliver the usability you need.

Get a sense of it:
Your ears will like the voice-recording features enabled by the built-in speaker and the unit's 18-bit analog/digital stereo sound; your eyes will be pleased with the multimedia apps and spacious screen. Itinerant types will like the ViewPad 100's CompactFlash and PC Card slots, which enable wireless or landline-based networking.

Notebook naysayers will say:
It's a chunky PDA that doesn't fit in your pocket, and its optional hardware keyboard adds even more bulk. But they'll concede that the ViewPad 100 builds a great computing bridge between the PC and the PDA.

See for yourself:
Viewsonic, *www.viewsonic.com*

34641

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For real-time pricing, go to *priceit.zdnet.com* and enter number.

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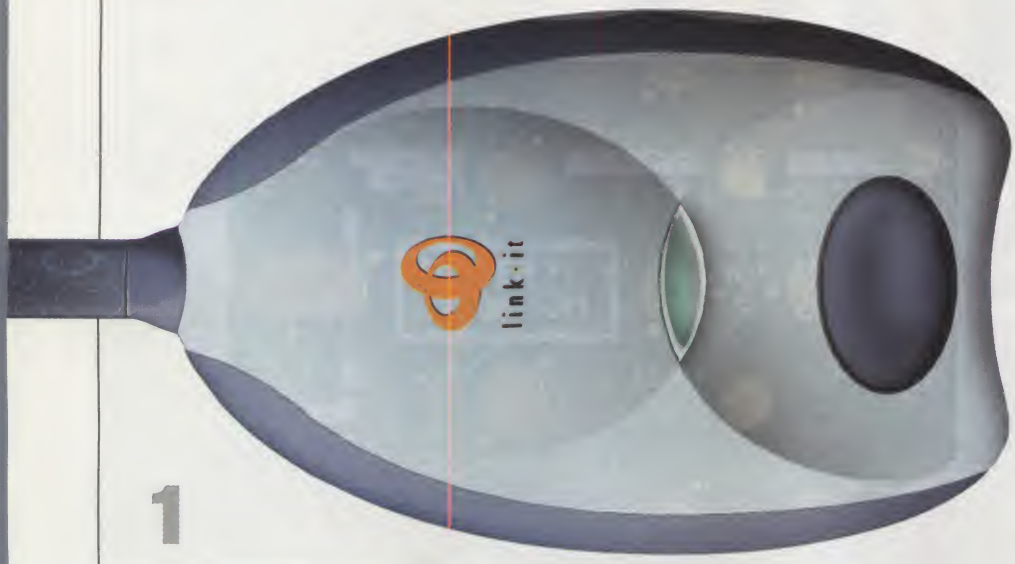

1

2

3

1 music master

Now you can rule the airwaves wherever you travel, thanks to Link-It from Akoo, a $29.95 device that enables you to beam tunes from your MP3 player to the car stereo. Simply plug the playing-card-size Link-It into the headphone output of your MP3 player (or any portable music device), and tune your FM car stereo to 88.1 or 88.3. The device wirelessly transmits audio to the in-dash stereo and pipes the sound through the car's speakers. Link-It lets you hijack any sound system with an FM tuner, too. That's sonic power.

Akoo Link-It
Akoo
www.akoo.com
34642

2 bearable lightness

If it's a truly totable projector that you need, here's the light-bright for you. Weighing just 3 pounds and roughly the size of a hardcover book, IBM's $4,649 MicroPortable Data/Video Projector delivers a new level of portability for peripatetic presentation jockeys. The device casts an ultra-bright 1,100 lumens onto a conference-room wall at a native XGA resolution. And with DVI-I and analog inputs, as well as HDTV compatibility, it's good to go for both legacy notebooks and all-digital video input. The MicroPortable isn't just for corporate presentations, however. It doubles as a great alternative to big-screen TV.

IBM MicroPortable Data/Video Projector
IBM
www.ibm.com
34645

3 watch shots

Looking to snap a few shots on the sly? If so, strap on Casio's $269 WQV3D-8 Wrist Camera watch. This sneaky device features a 25,344-pixel color CMOS sensor and enough memory to stash up to 80 compressed JPEG snapshots. A built-in 16-gray-scale monochrome LCD serves as both viewfinder and display for on-the-spot inspection of stored images. And you can attach up to 24 characters of text to each photo and transfer the pictures to your PC via infrared. You can also set your favorite snapshots to pop up when any of the five alarms sound.

Casio WQV3D-8 Wrist Camera
Casio
www.casio.com
34643

00000 = ZDNet Price It!™
For real-time pricing, go to *priceit.zdnet.com* and enter number.

4 video jukebox

The tone-deaf among us have a new reason to be afraid: Portable video karaoke has arrived. With a 1.8-inch TFT LCD and MP3-audio capabilities, Samsung's $499.99 **Photo Yepp YVP-P300** fuses pictures with digital audio. You can display a series of color images and even the lyrics to accompany any audio track. Shuttle music and images into the device's 64MB of RAM via the USB interface; a SmartMedia-card slot enables further expansion. The YVP-P300 also ships with a charging adapter, a remote control, earphones, and application software.

Samsung Photo Yepp YVP-P300
Samsung Electronics America
www.samsungusa.com
34644

5 robotic aquatics

Did you inadvertently kill your last goldfish? Here's a solution: mechanical marine life. The Takara Company, one of Japan's largest toy makers, has launched its Aquaroid line of robotic sea life. For instance, $64.95 will buy you the **Aquaroid BT 01,** a battery-powered jellyfish. This little critter will quietly swim around your aquarium and even shut itself off when the lights go out. And you don't ever have to buy pet food. If jellyfish seem disagreeable, you can opt for a turtle, ammonite seashell, or fish, all available from RoboToys.com.

RoboToys.com Aquaroid BT 01
RoboToys.com
www.robotoys.com
34646

6 handy cam

Pump up your Palm's multimedia capabilities with Kodak's newest PalmPix attachment. The $129.95 **PalmPix Camera** snaps effortlessly to the back of the latest Palm m500 and m505 handheld organizers, letting you use the Palm display to capture crisp SVGA color photos. You can view the snapshots on the handheld and, if you like what you see, transfer them to a PC. The PalmPix has a one-picture memory buffer and saves recorded images directly to the Palm's internal memory. The device weighs only 5 ounces and draws power from the handheld—no batteries required.

Kodak PalmPix Camera for m500 Series
Eastman Kodak
www.kodak.com
34647

4

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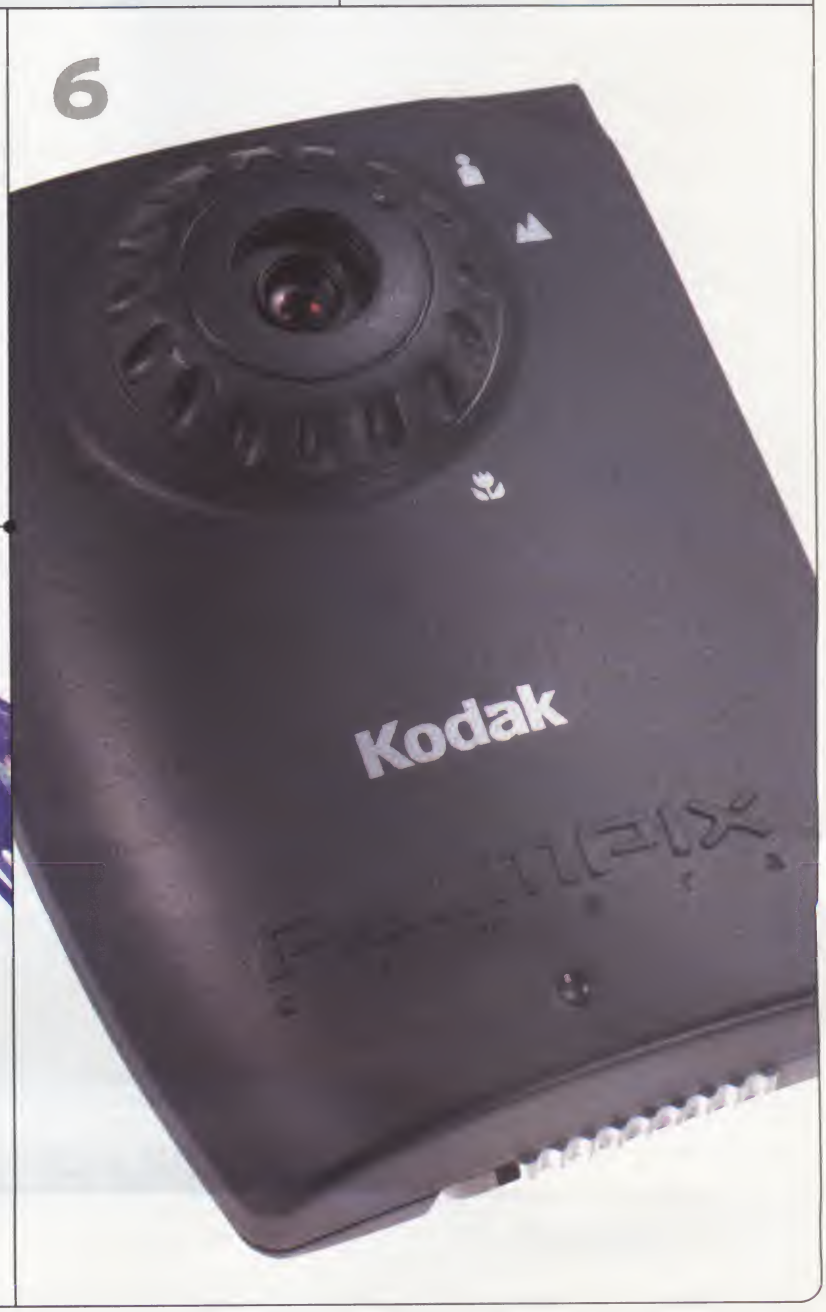

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- 15" (13.8" vis) M570 Monitor
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- Sound Blaster® 64V PCI Sound Card
- MS® Windows® Me & MS® Works Suite 2001 & Norton® AntiVirus™
- 1-Yr Ltd Warranty[2] ■ 1-Yr Mail-in Service

$599 E•VALUE CODE 05035-590805

BUSINESS LEASE: $17/MO., 48 MOS.[11]

- 17" (16.0" vis) E770 Monitor, add $60
- 2-Yr NBD On-Site Service[3], add $89
- APC® SurgeStation Pro8T2, add $39

DELL™ DIMENSION™ 4100

Advanced Business Desktop

- Intel® Pentium® III Processor at 1.0GHz
- 64MB SDRAM (up to 512MB)
- 20GB[5] Value HD
- 15" (13.8" vis) M570 Monitor
- 16MB ATI® Rage™ Pro Graphics
- 48X Max CD-ROM
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$799 E•VALUE CODE 05035-590807

BUSINESS LEASE: $22/MO., 48 MOS.[11]

- MS® Windows® 2000 Professional, add $99
- 3-Yr NBD On-Site Service[3], add $119
- APC® SurgeStation Pro8T2, add $39

DELL™ DIMENSION™ 8100

Cutting-Edge Business Desktop

- NEW Intel® Pentium® 4 Processor at 1.3GHz
- 128MB RDRAM (up to 2GB)
- 20GB[5] Value HD
- 15" (13.8" vis) E551 Monitor
- 32MB NVIDIA® GeForce2 MX 4X AGP Graphics
- 48X Max CD-ROM
- Integrated 3Com® 10/100 NIC
- MS® Windows® Me & MS® Works Suite 2001 & Norton® AntiVirus™
- 1-Yr Ltd Warranty[2] ■ 1-Yr NBD On-Site Service[3]

$999 E•VALUE CODE 05035-590809

BUSINESS LEASE: $28/MO., 48 MOS.[11]

- MS® Windows® 2000 Professional, add $99
- 3-Yr NBD On-Site Service[3], add $119
- Lexmark™ E312L Laser Printer, add $269

DELL™ NOTEBOOKS:

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NEW—Practical and Affordable Notebook

- Intel® Celeron™ Processor at 800MHz
- 12.1" SVGA TFT Display
- 128MB Shared[30] PC100 SDRAM
- 10GB[5] Ultra ATA HD
- Fixed Internal 24X Max Variable CD-ROM
- Intel® Integrated 3D® AGP Video
- 26.5WHr Li-Ion Battery
- Internal Mini-PCI 56K Capable[6] Modem
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Ltd Warranty[2], 1-Yr Mail-in Service, 1-Yr Phone Tech Support

$949 E•VALUE CODE 05035-890809

BUSINESS LEASE: $26/MO., 48 MOS.[11]

- 3-Yr Mail-in Service with Lifetime Phone Tech Support, add $99
- APC® Notebook Surge Protector, add $30

DELL™ INSPIRON™ 8000

Pinnacle of Performance Notebook

- Intel® Pentium® III Processor at 1.0GHz
- 15" Super XGA TFT Display
- 128MB 100MHz SDRAM
- 10GB[5] Ultra ATA HD
- Fixed Internal 24X Max Variable CD-ROM
- Modular Floppy Drive
- 16MB ATI® Mobility™-M4 3D® Video, 4X AGP
- 59WHr Li-Ion Battery w/ExpressCharge™ Technology
- Internal Mini-PCI 56K Capable[6] Modem
- MS® Office XP Small Business
- MS® Windows® Me
- 1-Yr Ltd Warranty[2], 1-Yr Mail-in Service, 1-Yr Phone Tech Support

$1889 E•VALUE CODE 05035-890818

BUSINESS LEASE: $52/MO., 48 MOS.[11]

- NEW Fixed Internal CD-RW/DVD Combo Drive, add $299

DELL™ LATITUDE™ C500

NEW—Wireless-Ready Value Notebook

- Intel® Celeron™ Processor at 700MHz
- 12.1" SVGA Active Matrix Display (14.1" XGA Available)
- 64MB SDRAM ■ 6GB[5] Ultra ATA HD
- 8MB ATI® Mobility™ 128 Video, 2X AGP
- MS® Windows® 98, Second Edition
- Modular 24X Max CD-ROM/Floppy Drive
- Internal Mini-PCI 56K Capable[6] SoftModem
- Li-Ion Battery w/ExpressCharge™ Technology
- Dual Pointing – Touchpad and Pointing Stick
- 1-Yr NBD On-Site Service[3]

$1299 E•VALUE CODE 05035-790812

BUSINESS LEASE: $36/MO., 48 MOS.[11]

- 14.1" XGA Active Matrix Display, add $150
- Deluxe Nylon Carrying Case, add $69

DELL™ DESKTOPS:

DELL™ OPTIPLEX™ GX150

Network-Optimized Managed PC

- Intel® Pentium® III Processor at 1.0GHz
- 128MB Shared[30] SDRAM (up to 512MB)
- 20GB[5] (7200 RPM) ATA/100 HD
- 17" (16.0" vis) E771p Monitor
- Integrated 3Com® 10/100 NIC
- Integrated Graphics with 4MB Graphics Performance Accelerator
- 48X Max CD-ROM ■ Integrated AC97 Audio
- MS® Windows® 2000 Professional
- OptiFrame™ Small Mini-Tower Chassis
- 3-Yr NBD On-Site Service[3]

$1199 E•VALUE CODE 05035-390811

BUSINESS LEASE: $33/MO., 48 MOS.[11]

- APC® SurgeStation Pro8T2 (8 Outlets), add $39
- Upgrade to Sony Trinitron® P780 Monitor, add $100

DELL™ OPTIPLEX™ GX400

NEW—Network-Optimized Managed PC

- Intel® Pentium® 4 Processor at 1.3GHz
- 128MB PC800 RDRAM (up to 2GB)
- 20GB[5] (7200 RPM) ATA/100 HD
- 17" (16.0" vis) M781p Monitor
- Matrox G450 32MB Graphics Card (Dual Monitor Capable)
- 48X Max CD-ROM
- Integrated 3Com® 10/100 NIC
- MS® Windows® 2000 Professional
- OptiFrame™ Mini-Tower Tool-less Chassis in Midnight Gray
- 3-Yr NBD On-Site Service[3]

$1399 E•VALUE CODE 05035-390813

BUSINESS LEASE: $39/MO., 48 MOS.[11]

- APC® Back-UPS 500VA, add $129
- 3Com® SS3 12-port Baseline Switch, add $378

DELL™ PRECISION™ 330

Advanced Performance Workstation

- Intel® Pentium® 4 Processor at 1.4GHz (up to 1.8GHz)
- Desktop Chassis in Midnight Gray
- Single Processor/RAID Capable
- 128MB PC800 RDRAM (up to 2GB)
- 20GB[5] (7200 RPM) EIDE HD (up to 73.4GB[5] 10K RPM SCSI)
- NVIDIA® TNT2 Pro 16MB 4X AGP Graphics Card
- Integrated NIC & Sound ■ 48X Max CD-ROM
- MS® Windows® 2000 Professional
- 3-Yr NBD On-Site Service[3]
- 7x24 Dedicated Workstation Phone Tech Support

$1199 E•VALUE CODE 05035-490811

BUSINESS LEASE: $33/MO., 48 MOS.[11]

- Monitor Sold as an Upgrade

DELL™ SERVERS:

DELL™ POWEREDGE™ 500SC

NEW—Basic Server at Our Lowest Price

- Intel® Celeron™ Processor at 800MHz (Available in Intel® Pentium® III Processor)
- 64MB 133MHz ECC SDRAM (up to 2GB)
- 10GB[5] (7200 RPM) IDE HD
- 48X Max IDE CD-ROM
- 1-Yr NBD On-Site Service[3], 1 Year Parts[2]
- 7x24 Phone Tech Support

$699 E•VALUE CODE 05035-290806

BUSINESS LEASE: $19/MO., 48 MOS.[11]

DELL™ POWEREDGE™ 1400SC

NEW—Small Business Value Server

- Intel® Pentium® III Processor at 933MHz
- Dual Processor Capable
- 128MB 133MHz ECC SDRAM (up to 2GB)
- 9GB[5] (10K RPM) Ultra3 (Ultra 160) SCSI HD (up to 36GB[5] 10K RPM)
- 48X Max IDE CD-ROM
- Embedded Ultra3 (Ultra 160) SCSI Controller
- Dell™ OpenManage™ Server Management
- 3-Yr NBD Bronze On-Site Service[3]
- 7x24 Phone Tech Support

$999 E•VALUE CODE 05035-290809

BUSINESS LEASE: $28/MO., 48 MOS.[11]

- 2nd 9GB[5] (10K RPM) Ultra3 SCSI HD, add $249
- MS® Small Business Server, add $1299

DELL™ POWEREDGE™ 2500SC

NEW—Affordable Scalability Server

- Intel® Pentium® III Processor at 933MHz
- Dual Processor Capable
- 128MB 133MHz ECC SDRAM (up to 4GB)
- 9GB[5] (10K RPM) Ultra3 (Ultra 160) SCSI HD
- Dual Integrated Ultra3 SCSI Controllers
- 24X Max IDE CD-ROM
- Dell™ OpenManage™ Server Management
- 3-Yr NBD Bronze On-Site Service[3]
- 7x24 Phone Tech Support

$1499 E•VALUE CODE 05035-290814

BUSINESS LEASE: $41/MO., 48 MOS.[11]

- Basic Server Installation, add $259
- MS® Windows® 2000 Server, add $799

intel inside pentium®III

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VALUE™

Dell computers are available pre-loaded with Microsoft Windows 2000 Professional, which is over 13 times more reliable[43] and up to 30 percent faster[40] than Windows 98. Add MS Windows 2000 to your Dimension desktop or Inspiron notebook for $99.

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Computer Shopper and ZDNet editors pick the best values among the latest products.

Polk Audio AMR150

DESKTOPS

Alienware Area 51
The Area 51 has everything you'd expect from a top-tier gaming machine, but what really impressed us was the incredible attention Alienware paid to even the smallest details when creating this powerhouse PC.
SEE THIS MONTH'S FEATURE ON P. 98
Alienware • *www.alienware.com*
Direct Price: $3,499 34637

Atlas Micro AS5000
Priced around $1,000, Atlas Micro Logistic's AS5000 is an exceptional bargain with a real performance kick. We were particularly impressed with the system's DVD playback and sound quality.
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Atlas Micro Logistic • *www.buy-atlas.com*
Direct Price: $999 34467

Atlas Micro XS5000
The XS5000 is comparable in almost every respect to other Athlon/DDR systems, but it costs about $1,000 less and includes a quality sound system, a 30-day money-back guarantee, and a three-year parts-and-labor warranty.
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Direct Price: $1,779 34455

Dell Dimension 4100
The Dell Dimension 4100 is the fastest 1GHz Pentium III/Windows Me-based PC we've tested, a premium system without the premium price. Solid components such as its nVidia GeForce2 MX-based graphics card and 7,200rpm hard drive make all the difference.
REVIEWED IN JULY ISSUE
Dell Computer • *www.dell.com*
Direct Price: $1,549 34477

Gateway Performance 1700XL
This 1.7GHz machine is a desktop powerhouse brimming with a vast array of features, including an excellent 19-inch display and a 75GB hard drive, plus three IEEE 1394 (FireWire) and four USB ports.
REVIEWED IN AUGUST ISSUE
Gateway • *www.gateway.com*
Direct Price: $2,624 34521

Xi MTower SP
Equally well-suited for both die-hard gamers and demanding business professionals, the Xi MTower SP is quite simply one of the fastest systems we've ever tested, helped by its killer graphics board with 64MB of onboard DDR memory and dual RAID-controlled hard drives.
REVIEWED IN JULY ISSUE
Xi Computer • *www.xicomputer.com*
Direct Price: $2,550 34459

Alienware Area 51

HARDWARE

HP CD-Writer DVD Combo 9900ci
The 9900ci combines the capabilities of a 12x/10x/32x CD-RW with an 8x DVD drive. It delivered performance comparable to competitors' combo drives, with the additional advantages of easy installation and a top-notch software bundle.
REVIEWED IN AUGUST ISSUE
Hewlett-Packard • *www.hpshopping.com*
Direct Price: $349 34505

Logitech Cordless MouseMan Optical
Logitech's new cordless optical mouse is an engineering marvel that uses wireless radio and pinpoint optical technologies.

Decked out with features such as a WebWheel and a browser-back button, this is one mouse you'll gladly grab.
REVIEWED IN AUGUST ISSUE
Logitech • *www.logitech.com*
Direct Price: $69.95 34518

Microtek ScanMaker V6UPL
A great option for home and small-office use, the ScanMaker V6UPL produced crisp images and achieved outstanding speed in our lab tests. It's one of the finest scanners we've seen in this price range.
REVIEWED IN AUGUST ISSUE
Microtek • *www.microtek.com*
Mfr. Est. Price: $129.99 34509

Olympus Camedia C-2040 Zoom
Don't be fooled by the Olympus Camedia C-2040's diminutive size. This 2.1-megapixel camera takes sharp, bright pictures and is loaded with impressive features, including the fastest zoom lens in its class.
REVIEWED IN JULY ISSUE
Olympus America
www.olympusamerica.com
Mfr. Est. Price: $499 34479

Pacific Digital TurboWriter 121032ei
The TurboWriter's FileCD utility undermined its performance, but this CD-RW drive still had the fastest disc-read score in our roundup. It also boasts a terrific $149 price and includes buffer-underrun protection.
SEE THIS MONTH'S FEATURE ON P. 110
Pacific Digital • *www.1pdc.com*
Direct Price: $149 34616

Polk Audio AMR150
A four-channel multimedia speaker system, Polk's AMR150 rivals the sound quality of home audio speakers with accurate highs, powerful lows, and mellow middle frequencies.
SEE THIS MONTH'S REVIEW ON P. 70
Polk Audio • *www.polkaudio.com*
Direct Price: $149.95 34602

Samsung SyncMaster 570vTFT
One of the first analog LCD monitors priced under $500, the SyncMaster 570vTFT has well-designed controls with all buttons easily accessible from the front, and excellent image quality at its native 1,024-by-768 resolution.
REVIEWED IN AUGUST ISSUE
Samsung Electronics America
www.samsungmonitor.com
Mfr. Est. Price: $499 34504

Voyetra Turtle Beach Santa Cruz
In addition to terrific sound quality, the $79.95 Santa Cruz offers a wonderfully innovative I/O configuration and an outstanding selection of digital effects.
REVIEWED IN JULY ISSUE
Voyetra Turtle Beach
www.turtle-beach.com
Mfr. Est. Price: $79.95 34454

GAMES

Black & White
Black & White is a massive, multitiered game in which players adopt the role of a benevolent or evil god. With its stunning graphics, engrossing AI, and smartly designed game mechanisms, this game is bound to please even the pickiest players.
REVIEWED IN JULY ISSUE
Electronic Arts • *blackandwhite.ea.com*
Mfr. Est. Price: $39.95 34481

Emperor: Battle for Dune
It won't revolutionize the real-time strategy genre, but Emperor: Battle for Dune is a highly enjoyable game that emphasizes fast, intense skirmishes and has lots of replay value thanks to its three single-player modes and satisfying multiplayer features.
SEE THIS MONTH'S REVIEW ON P. 96
Westwood Studios
www.westwood.ea.com
Direct Price: $49.95 34635

Myst III: Exile
In addition to its photo-realistic graphics, Exile delivers intellectual challenge and solid storytelling, as well as a sense of surreal whimsy. Gamers of all stripes will find something here.
REVIEWED IN AUGUST ISSUE
Ubi Soft Entertainment
www.ubisoft.com
Mfr. Est. Price: $44.99 34534

Emperor: Battle for Dune

SOFTWARE

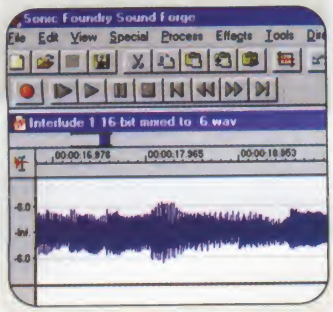
Adobe Acrobat 5.0
Acrobat 5.0 improves on its predecessors by adding 128-bit encryption and increased granularity for setting annotation privileges. New markup tools are also available, including a data repository for storing workgroup comments.
REVIEWED IN AUGUST ISSUE
Adobe Systems • *www.adobe.com*
Mfr. Est. Price: $249; $99 (upgrade) 34522

NetObjects Fusion MX
Fusion MX makes complex Web design relatively easy with its library of 200 styles and its ability to manage repeated elements such as navigation bars.
REVIEWED IN JULY ISSUE
NetObjects • *www.netobjects.com*
List Price: $99.95 34464

PC Upgrade Commander
If you're planning to migrate applications, data, and settings from one computer system to another, don't think of doing it without PC Upgrade Commander, a handy piece of software that lets you upgrade with ease.
SEE THIS MONTH'S REVIEW ON P. 92
V Communications • *www.v-com.com*
Direct Price: $49.95 (boxed version); $39.95 (download) 34601

Pinnacle Studio DV
Digital-camcorder owners will want to plug in to Pinnacle Studio DV, a DV-only video editor that comes bundled with an IEEE 1394 (FireWire) interface board. The package combines a broad range of functions, such as the ability to capture and edit lower-quality video with an outstanding interface.
SEE THIS MONTH'S FEATURE ON P. 128
Pinnacle Systems
www.pinnaclesys.com
Mfr. Est. Price: $89 34633

Sound Forge 5.0
Sound Forge 5.0 reclaims the software's status as the premier two-track audio editor by incorporating support for 24-bit audio, CD burning and ripping, and DirectX plug-ins that let you apply multiple effects simultaneously.
REVIEWED IN AUGUST ISSUE
Sonic Foundry • *www.sonicfoundry.com*
Direct Price: $399.96 (packaged); $349.97 (download) 34502



Sony CLIÉ PEG-N710C

MOBILE

Apple iBook
Apple's newest iBook is cheaper, thinner, faster, and offers far more features—such as a DVD drive and 8MB of video memory—

than earlier iBooks. Indeed, this iBook is one of the finest consumer notebooks we've seen.
REVIEWED IN AUGUST ISSUE
Apple Computer • *www.apple.com*
Direct Price: $1,499 34546

Sony CLIÉ PEG-N710C
Sony's newest PDA outpaces its Palm OS-based competition with a sleek design, a beautiful color display, and a rich feature set that includes audio and video playback.
REVIEWED IN AUGUST ISSUE
Sony Electronics • *www.sony.com/clie*
Mfr. Est. Price: $499.99 34543

WinBook X1
Equipped with a 1GHz Pentium III and a whopping 320MB of SDRAM, the WinBook X1 delivers heavyweight performance while tipping the scales at just 6.2 pounds. It also has a smartly designed aluminum case that prevents the unit from getting too hot.
REVIEWED IN JULY ISSUE
WinBook Computer • *www.winbook.com*
Mfr. Est. Price: $3,098 34488

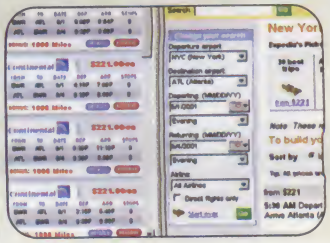
NETWORKS

D-Link DWL-920 11Mbps USB Wireless Home Network Kit
Combining an access point for broadband connections with two USB network adapters, D-Link's DWL-920 offers a simple and flexible approach to building an 802.11b wireless home network.
REVIEWED IN JULY ISSUE
D-Link Systems • *www.dlink.com*
Mfr. Est. Price: $499 34480

WEB SERVICES

eDiets.com
eDiets.com helps you stick to your diet, providing personalized meal plans and letting you schedule and maintain your exercise program. The site also offers a wealth of feedback from experts and fellow dieters alike.
REVIEWED IN AUGUST ISSUE
eDiets.com • *www.ediets.com*
Price: $39 for three months, $10 each additional, or $75 per year 34527

SideStep
SideStep, a free travel-planning plug-in for Internet Explorer, lets you search the databases of 80 travel suppliers directly, possibly finding cheap fares that Expedia and Travelocity.com overlooked.
REVIEWED IN JULY ISSUE
SideStep • *www.sidestep.com*
Price: Free 34470



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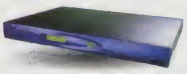

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JOHN BLACKFORD

The Newest Notebooks: Plus-Ultra Portables

The appeal of ultraportable PCs increases as their size and weight decrease. It's easy to see why.

WHAT ARE POPPING UP EVERYWHERE AND CONSTANTLY shrinking in size, but will not vanish? Nope, it's not handheld PDAs. It's ultraportable PCs.

While PDAs are undeniably popular, one unintended result of their popularity is that ultraportables look so much better by comparison. I first realized this after seeing at Staples the shattered remains of a Palm add-on keyboard, with keys missing and wires peeking out. True, lots of customers had been working it over, but the resulting wreckage made my ultraportable notebook PC seem indestructible by comparison. Besides a fold-down top to protect the keyboard, my notebook offers 10.4 inches of bright color screen, versus the Palm's dim 3-inch monochrome display.

No, I'm not dumping my Palm, but I've pretty much abandoned the idea of word processing on the device. Such work is far easier on my IBM ThinkPad 240, which, at less than 3 pounds, is also easy to tote. So it's easy to see why supersmall laptops are growing more popular.

And as these ever-faster, ever-lighter systems push technology boundaries, they also are changing definitions. The term "ultraportable" or "ultralight" once referred to notebooks with screens of around 12 inches with a weight of 3.5 to 4 pounds. Not any more: The latest crop includes the Casio Cassiopeia Fiva, which weighs 2.2 pounds and includes an 8.4-inch, 800-by-600-pixel display. Today, an ultralight is any notebook under 4 pounds with a keyboard, and a processor and screen capable of handling Microsoft Windows.

NEW CHIPS ON THE BLOCK

Although these superlight portables are the result of lots of experimentation, they haven't created a new category, but rather extend an existing one.

The new ultralights employ either Transmeta's Crusoe TM5600 or Intel's Pentium III Processor-M, both small but powerful CPUs that don't draw much electricity. Battery life ranges from a few hours up to eight. Four units that use the Transmeta chip are the NEC Versa DayLite, Fujitsu FMV-Biblo Loox T, Casio Cassiopeia Fiva, and a new version of Toshiba's Portégé. The Fujitsu runs at 533MHz, the others at 600MHz. A fifth model, the Compaq Evo N200, uses the Pentium III Processor-M, a new CPU that several other vendors plan to incorporate into their ultramobile notebooks. Compaq's faster N400C incorporates a docking station to provide added flexibility.

Most of the newest members of the ultralight family pare weight by keeping CD-ROM and floppy drives off board, so if you need these devices, you must pack them when traveling. Some ultralights do include the normal complement of serial, parallel, and USB ports, and others even provide IEEE 1394 (FireWire) connectors.

Despite the popularity of ultralights, most users still prefer full-size notebooks, which enable them to use the devices as replacements for a desktop PC. Nonetheless, every year the percentage of ultralight sales increases when compared with full-size portables, just as the overall percentage of notebooks is gaining over desktops. Also expanding are the number of individuals who own both a desktop and an ultralight. They realize an ultralight can't replace a desktop, but that it does make a fine supplement to one. For those who want it all, Compaq's Evo N400C offers a nice mix of portability and power.

CLEVER KEYBOARDS

And for those who want less, there's a totally new category of portable computing devices that might be referred to as smart keyboards. These units don't run Windows and have no hard drive, but they do provide full-size keyboards, four- to eight-line displays, and the ability to store 50 to 100 pages of text. Models such as the QuickPad, the AlphaSmart 3000, and Perfect Solutions' Laser PC6 weigh only a couple of pounds and cost a few hundred bucks. At present, however, such units upload text files to a PC or Mac via a cable link, and don't enable Web browsing or offer much in the way of calendar or address-book capabilities.

The jury's still out on these emerging über-keyboards, but there's no question that the new class of ultralights packs lots of punch for those willing to forgo the CD-ROM and floppy drive. At around $2,000, though, ultralights are no mass-market item.

john_blackford@zdnet.com

ILLUSTRATION BY DAVID RIDLEY/SIS

SECTION CONTINUES ON PAGE 52

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> Jacks: 1 Line-In, 1 Line-Out and 1 Micraphane
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Common Features

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> Other Parts: 1S, 1P, Ext. Keyboard and Ext. CRT
> Jacks: 1 Headphone and 1 Micraphone
> Microsoft® Windows® ME
> Carrying Case and AC Adapter
> Slim Notebook: 12.1"w x 10.0"d x 1.48"h

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> 10.0GB, 20.0GB, or 30.0GB Hard Drive opt.
> 3.5" 1.44MB FDD
> 3D Sound Effect
> 2 Built-In Sterea Speakers and 1 Built-In Microphane
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> 1 Type II PCMCI2A Slat
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> 56K Capable[3] V90 Madem
> Infra Red, Wireless Fast IR Interface
> 1 USB Port
> Other Parts: 1S, 1P, Ext. Keyboard and Ext. CRT
> Jacks: 1 Headphane and 1 Micraphone
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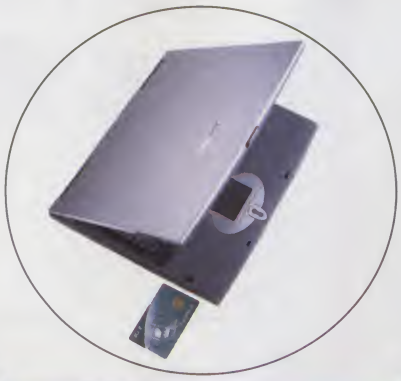

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JOHN C. DVORAK

Disruptive Technologies and Unintended Consequences

Radical technologies such as DVD re-editing have the power to turn mild-mannered moviegoers into armchair film editors.

TWO TERMS IN THE TECHNOLOGY COMMUNITY BOTH epitomize the modern age and befuddle investors with their frightening impact on equity: "disruptive technology" and "unintended consequences."

The first is a Silicon Alley term that describes a development so radical, it can dramatically shift market-share leadership and throw equity valuations out of kilter overnight. It can strike at any moment and change company valuations quickly, so it makes long-term investing risky, and no company is immune.

I've yet to trace the term's origin, but I don't recall hearing it before 1990, so I assume it started with the Internet boom. Valley boys love using it, and startups routinely use it to describe their offerings. In fact, I wonder if you can even get money without categorizing your product as such.

The PC is probably the best example of disruptive technology. The invention of the laser printer is another, even though it occurred before the term was invented. More recent examples are DSL and cable modems. I'd also like to cite Digital Light Processing (DLP), a Texas Instruments technology used in small digital projectors to project large images. A larger version of DLP is used to project massive images and will become the basic technology used in digital theaters.

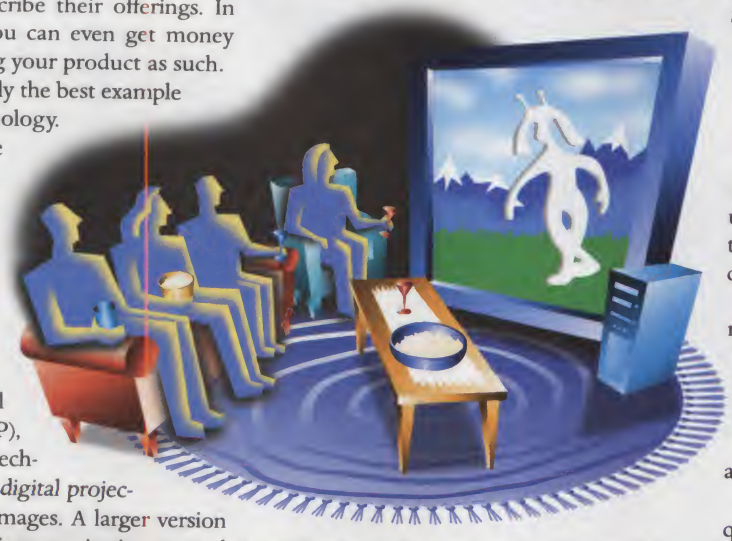

ILLUSTRATION BY JOHN BLECK

UNINTENDED CONSEQUENCES

It's digital movies that bring me to the second half of the disruptive-technology effect. Unintended consequences always follow in the footsteps of disruptive technology. They're not immediately identifiable, and they're never predictable. The unintended consequence of the digital-movie revolution is appearing in humorous ways.

The best example began with a bootleg copy of the *Star Wars* prequel, *Episode I: The Phantom Menace*. By any standards, the movie, as presented to theatergoers, was mediocre. It was enjoyable, but hardly a good film. So, some guy gets a copy of the digital master and edits out the Jar Jar Binks character (except where he's in an important group scene just standing there or doing little). He then passes the film around the Net for review. Turns out it's not only shorter and tighter, but much faster-paced. Apparently, nothing was lost by leaving this stupid character on the cutting-room floor. Rumor has it George Lucas is up in arms. This must have been some character he loved, like Howard the Duck.

I haven't seen this cut version of the movie, and still wonder how someone obtained a digital copy of the film. Although a DVD version is in the works, Lucas has delayed its release on DVD—as he has so many of his other films—supposedly for some deep marketing reason. Is it possible he was visionary enough to sense something like an independent re-edit could appear and do nothing but embarrass him? Thus his apparent dislike of DVD?

Re-editing analog content is nothing new, but it was usually reserved for the privileged few with access to master copies. With everyone having a master copy (DVD), and with the emergence of all sorts of editing equipment, anyone can do it. If you haven't noticed, remixing dance songs has been avant-garde for years, with dance clubs playing the creations of favorite remix experts. What happens to the movie business when amateurs or hobbyists begin to remix (re-edit) movies? Havoc is my guess. TV shows could be fair game, too, although less compelling.

Another odd unintended consequence of digital technology affecting Hollywood content is the wacky Web site where someone takes voice clips of Arnold Schwarzenegger, Joe Pesci, and other actors, and punches up various quotes on command while linked on a phone call. A customer-service representative gets an angry call from Arnold, and a weird conversation ensues until the rep either figures out what's going on or hangs up on the rude customer. The Web site then posts these weird chats so we can all chuckle over them.

This kind of sampling and use for a movie soundtrack could never have been expected. And I suspect fair-use laws would protect it. The site I first saw this stunt on was down last time I looked, but other sites are mirroring these tapings. Look around for them.

In the early stages of unintended consequences, you usually see a lot of odd experimentation followed by various attempts at exploitation and commercialization. Sometimes nothing ever comes of it, but most often a disruptive technology will fundamentally change the way things work in some interesting way. We're just beginning to see the unintended consequences of digital media, from the Napster experiment to the Jar Jar Binks re-edit. You can be certain this is only the beginning.

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SECTION CONTINUES ON PAGE 56

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Can Retailers Get Kiosks Right?

Shoppers deserve so much more than what today's kiosks offer.

ONCE UPON A TIME, ONLINE SHOPPING WAS GOING TO MAKE retail stores obsolete. Then we woke up. Shoppers like to ask questions, examine major purchases, and buy without shipping delays.

Enter online kiosks. According to a Jupiter Media Metrix report, 77 percent of consumers have noticed kiosks and 41 percent have used them. They'll account for $200 million in purchases this year and $6.5 billion by 2006. By that time, 11 percent of the online population will use kiosks, influencing $77 billion in offline sales.

A NEW LOOK AT AN OLD IDEA

Kiosks have been around for decades in catalog showrooms such as Service Merchandise, but they weren't user-friendly and often relied on paper for searching. Some, such as J.C. Penney's catalog stores, were nothing more than paper catalogs and phones. When old-fashioned store-catalog retailers fell on hard times in the '90s, the old kiosks went with them.

As PC hardware got cheaper and networking became ubiquitous through the Internet, brick-and-click retailers such as Barnes & Noble, The Gap, and Kmart began promoting their Web sites through in-store kiosks. J.C. Penney and a revamped Service Merchandise are adding Web-based kiosks from software provider Netkey. By this spring, Borders had its Netkey-based Title Sleuth kiosks in all its stores, with in-stock indicators and estimated arrival times for special orders. A credit-card swipe makes shopping through the kiosks easy. You can even check inventory at other Borders stores.

The kiosk concept lets retailers open small stores in places they could never afford to open major outlets. The Jupiter study revealed 10 percent of music and video sales at Virgin's small U.K.-based V.shops are through kiosks, which offer a much broader selection than the shelves.

Still, many early kiosk programs received a lukewarm response. In some cases, placement of the kiosks was the problem; a Kmart BlueLight.com kiosk on the wrong side of a checkout counter comes to mind.

Just slapping up a general Web site doesn't always cut it with kiosks. The Jupiter study noted 76 percent of those who didn't make any purchases through kiosks said the kiosks didn't offer them what they needed at the moment. Can Kmart say "Martha Stewart kiosk?"

THE PATH TO UBIQUITY

Of course, the most ubiquitous and successful kiosks are the ones you never think about, such as ATMs and the credit-card reader at your local gas pump. In New York City, AOL Moviefone has a kiosk in which you insert your credit card to get tickets.

Some retailers are learning from such specificity of purpose. At press time, 7-Eleven's V.com kiosk trial in Texas and Florida was offering ATM services, check cashing, and money-order purchases. You may not be near your bank, but you can always find a 7-Eleven. Northwest Airlines and U.S. Airways offer self check-in at the gate, and U.S. Airways throws in reward miles as a bonus. In Fidelity's retail outlets, you can use Netkey-based kiosks for deposits, portfolio management, and research.

Product information will play a big role in future kiosks, predicts Jupiter analyst Heather Dougherty. Imagine printing a purchase list and maps of Home Depot to help you find the materials for your next project. On a small scale, sports retailer REI's kiosks show shoppers how to install a car ski rack. Another possibility is music and movie clips. The Jupiter survey revealed 34 percent of consumers expressed an interest in sampling these products through kiosks.

SLOW GOING

Although Jupiter found no major financial or technical obstacles to kiosks, retailers need to prove they have the will and the way to make them successful. I found the Title Sleuths at my local Borders to be helpful, once I got past the screen-resolution glitch that cut off the product descriptions. Borders recently shuttered its online division and handed operations, including fulfillment and customer service, over to Amazon.com. A cobranded Web site was due in August. "I think we just realized that Amazon.com understands online, and we don't," offered one Borders salesperson. "Amazon will probably make us change everything anyway. Maybe they'll even enable the card swipe."

I think store shoppers will probably use Title Sleuth more if it was cobranded with Amazon. The pure-play giant could offer online ordering with in-store pickup for those who want immediate gratification and don't want to pay for shipping. Borders is already looking into ways to let shoppers reserve in-stock books for in-store pickup, and yes, it even has the card swipe working in several test locations. That just leaves Borders to figure out how to get retail employees motivated about the kiosks. "Hey," called out my new friend as I left the store, "At least we've still got this store thing down pat!"

jobrien_eshopper@mail.com

ILLUSTRATION BY TIM COOK

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[1]MHz/GHz only measures microprocessor internal clock speed; many factors affect application performance. [2]System includes chipset that uses some main memory for the video subsystem. The amount used will vary depending on video mode and may be as much as 8MB. Thus, accessible system memory is less than the amount stated. [3]GB equals one billion bytes when referring to storage capacity; accessible capacity may be less. [4]CD-RW, DVD-ROM and CD-ROM drives list a variable read rate. CD-RW write and re-write speeds vary and list only the maximum possible. Actual CD-RW, DVD-ROM and CD-ROM speeds will vary and are often less than the maximum possible. The read and write results of the CD-RW drive depend on the quality and characteristics of the CD-R and CD-RW media used. Poor results may be obtained with some media suppliers. [5]Some software may differ from its retail version (if available), and may not include user manuals or all program functionality. For non-IBM software, applicable third-party licenses may apply. Warranty, service and support for non-IBM products, if any, are provided by third parties, not IBM. IBM makes no representations or warranties regarding non-IBM products. [6]For terms and conditions or copies of IBM's Statement of Limited Warranty, call 1 800 772-2227 in the US and in Canada call 1 800 426-2255. Telephone support may be subject to additional charges. For warranties including onsite labor, customer may be asked certain diagnostic questions before a technician is sent. [7]Pricing shown is price available from IBM directly. Reseller prices may vary. IBM price does not include tax or shipping and is subject to change without notice. [8]SuccessLease is offered by third-party providers of business financing approved by IBM Global Financing. SuccessLease terms and conditions provided by the third party. Featured monthly lease payments include prespecified purchase option at end of lease, to qualified business customers only, installing in the US. Documentation fee and first month's payment due at lease signing; taxes are additional. Offer may be withdrawn or changed without notice. Options cannot be leased separately. [9]Certain Microsoft® software product(s) may use technological measures for copy protection. IN SUCH EVENT, YOU WILL NOT BE ABLE TO USE THE PRODUCT IF YOU DO NOT FULLY COMPLY WITH THE PRODUCT ACTIVATION PROCEDURES. Product activation procedures and Microsoft's privacy policy will be detailed during initial launch of the product, or upon certain reinstallations of the software product(s) or reconfigurations of the computer, and may be completed by Internet or telephone (toll charges may apply). IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM cannot be responsible for photographic or typographic errors. SuccessLease and all IBM product names are registered trademarks or trademarks of International Business Machines Corporation. Lotus and SmartSuite are registered trademarks of Lotus Development Corporation, an IBM company. Intel, the Intel Inside logo and Pentium are registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. ©2001 IBM Corp. All rights reserved.

MICHAEL SLATER

Why Pricey Gadgets Remain a Tough Sell

Mainstream consumers aren't convinced they need the latest consumer-electronics products.

DESPITE THE INFORMATION APPLIANCE'S PROMISE OF simpler access to increasingly pervasive digital content, the new devices haven't achieved much success. Early Web appliances, such as Netpliance's iOpener and 3Com's Audrey, have come and gone shockingly quickly.

Considering how few consumer-electronics devices have achieved mainstream success in the past few decades, this isn't surprising. Most new devices were simply replacements—CD players replacing turntables, portable phones replacing wired ones, timer-controlled thermostats replacing manual ones.

Few consumer-electronics products that perform a new function have succeeded in gaining mainstream adoption. The big winners are mostly decades old: the telephone, the record player, radio, and television. Stereo equipment is the biggest category to blossom in recent decades. But not since the VCR and the microwave oven has a new category of device become ubiquitous, with the sole exception of the PC.

The PC and its peripherals weren't created as consumer devices, however. They were created for business users, and consumers have reaped the benefits (and felt the pain) of minimally modified business machines. PDAs appear to be following the same path from business to consumer use, but they remain far short of mainstream consumer acceptance.

In light of this history, it's apparent the bar new consumer-electronics devices must clear to achieve mass-market success is high. Most consumer-electronics success stories center around products that represent incremental advances—not products that do new things, but that do the same thing in a portable fashion. Consider the evolution from fixed to cordless to cell phones, or from record players to boom boxes to handheld music players.

Why have so few new consumer devices succeeded? There are many reasons, each sufficient to doom most products.

GADGETS ARE FOR GEEKS

First, unlike early adopters, mainstream consumers aren't interested in gadgets or in technology hobbies. They're only interested in a new device if the value it brings is greater than the cost, in terms of both time and money. MP3 players and digital cameras are two classes of device still struggling to cross this chasm. Mainstream consumers are risk-averse and won't buy a new device unless it feels like a safe bet.

Second, no effective sales and distribution channel exists for new consumer-electronics products. Retailers are notoriously unable to educate consumers about new products or create consumer demand; they do best when consumers come into the store knowing what they want.

Third, many new products simply cost too much to make to sell at mainstream prices. Truly high-volume consumer products at prices above $299 are rare. Web tablets are caught in this bind. Vendors can build compelling devices, but only at prices far too high to achieve mainstream success.

Fourth, financial support for developing new kinds of consumer products is hard to come by. It typically takes many years for the volume of a new type of device to reach a profitable level, and soon thereafter, intense competition usually drives prices down to a point where it's difficult to make much money. The venture-capital community just isn't interested in financing this kind of business; they have better places to put their money to work.

Fifth, the huge consumer-electronics companies with the greatest financial motivation to create new classes of products are largely incapable of creating great user interfaces or software-based products. How many of you know people who've never figured out how to program their VCRs?

Returning to information appliances, we can draw some critical conclusions from history. The most successful information appliances will be derivatives of existing devices, performing functions for which people already buy devices. This line of reasoning suggests information capabilities added to cell phones will be far more widespread than those added to PDAs. Consumers will buy digital set-top boxes to get more television programming and enable time shifting. Information applications will ride into the living room on the coattails of TV access.

In addition, repurposing business technology is a more likely path to consumer markets than inventing entirely new consumer devices. The first successful tablet devices are likely to follow Microsoft's Tablet PC design, for example, leveraging PC software to create a more functional product than the simpler, cheaper dedicated Web tablet.

THE PC AS INFO APPLIANCE

Most mainstream consumers just don't want more devices, and it's hard to create compelling reasons for them to buy a new kind of product—even if the maker can get it to a mainstream price point, find a way to generate demand, and distribute the product effectively. For better or worse, the PC and its derivatives will remain the predominant "information appliances" for at least the next five to 10 years, even if they aren't very appliance-like.

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ILLUSTRATION BY BILL RIESER

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[1]Based on comparisons with the following models offering a 14.1" display as of 2/15/01: Compaq Armada M700, Dell Latitude C600 and Inspiron 4000, Sony Vaio XG700, Fujitsu Lifebook E series, Toshiba Tecra 8200, Hewlett-Packard Omnibook 6000, Net Versa SXi, Acer TravelMate 520, Micron Transport LT, Winbook and Gateway Solo 5300. [2]Titanium Composite Carbon Fiber Reinforced Plastic has three times the strength of ABS plastic as tested by IBM using the high flex modulus test on 2/28/00. Available on select models. [3]March 2001. [4]MHz/GHz only measures microprocessor internal clock speed; many factors affect application performance. For mobile Intel Pentium III processors featuring SpeedStep technology, this denotes maximum performance mode; battery optimization mode is approximately 80% of maximum performance mode. [5]GB equals one billion bytes when referring to storage capacity; accessible capacity may be less. [6]CD-RW, DVD-ROM and CD-ROM drives list a variable read rate. CD-RW write and re-write speeds vary and list only the maximum possible. Actual CD-RW, DVD-ROM and CD-ROM speeds will vary and are often less than the maximum possible. The read and write results of the CD-RW drive depend on the quality and characteristics of the CD-R and CD-RW media used. Poor results may be obtained with some media suppliers. [7]For non-IBM software, applicable third-party licenses may apply. Warranty, service and support for non-IBM products, if any, are provided by third parties, not IBM. IBM makes no representations or warranties regarding non-IBM products. [8]For terms and conditions or copies of IBM's Statement of Limited Warranty, call 1 800 772-2227 in the US and in Canada call 1 800 426-2255. Telephone support may be subject to additional charges. For warranties including onsite labor, customer may be asked certain diagnostic questions before a technician is sent. Warranty does not include ThinkPad battery, which is covered by a separate, one-year limited warranty. [9]Pricing shown is price available from IBM directly. Reseller prices may vary. IBM price does not include tax or shipping and is subject to change without notice. [10]SuccessLease is offered by third-party providers of business financing approved by IBM Global Financing. SuccessLease terms and conditions provided by the third party. Featured monthly lease payments include prespecified purchase option at end of lease, to qualified business customers only, installing in the US. Documentation fee and first month's payment due at lease signing; taxes are additional. Offer may be withdrawn or changed without notice. Options cannot be leased separately. [11]Certain Microsoft® software product(s) may use technological measures for copy protection. IN SUCH EVENT, YOU WILL NOT BE ABLE TO USE THE PRODUCT IF YOU DO NOT FULLY COMPLY WITH THE PRODUCT ACTIVATION PROCEDURES. Product activation procedures and Microsoft's privacy policy will be detailed during initial launch of the product, or upon certain reinstallations of the software product(s) or reconfigurations of the computer, and may be completed by Internet or telephone (toll charges may apply). [12]This product is manufactured for and distributed and sold by Betesh/Motion Systems. IBM, the IBM logo and IBM trade dress are owned by International Business Machines Corporation and are used under license from IBM. IBM does not manufacture this product and provides no warranty or support for this product. Please contact Betesh/Motion Systems for all questions/comments and service or support related to this product. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM cannot be responsible for photographic or typographic errors. SuccessLease and all IBM product names are registered trademarks or trademarks of International Business Machines Corporation. Lotus and SmartSuite are registered trademarks of Lotus Development Corporation, an IBM company. Intel, the Intel Inside logo and Pentium are registered trademarks and Celeron and SpeedStep are trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. ©2001 IBM Corp. All rights reserved.

DESKTOPS

HP PAVILION 7875

A Feature-Filled, Though Underperforming, Athlon

TODAY'S NEW PCS ARE SO POWERFUL THAT IT SEEMS LIKE EVEN midrange, average-performance models have more than enough speed to accomplish almost any task. Hewlett-Packard's Pavilion 7000-series PCs, targeted at home users, fall into that category. The Pavilion 7875 is currently the fastest of the 7000s, built around an Asus A7M266-M motherboard and a 1.3GHz AMD Athlon CPU. This PC offers a good complement of features, but it's not an outstanding performer for its processor speed and is relatively pricey at $2,048.

The 7875's case is typical of the Pavilion line, gray and sculpted with a covered compartment on top for often-used CD or DVD discs. Another convenience is a set of ports on the front of the case, allowing quick connection of one serial, one IEEE 1394 (FireWire), and two USB devices without having to fish behind. Pinnacle Systems' Studio DV 1.06 video-editing software is part of the 7875's software bundle, and, paired with the IEEE 1394 port, gives you the potential to chew up quite a bit of the Maxtor 80GB Ultra ATA/100 hard drive in short order with digital-video files. The 5,400rpm drive delivers performance that's fine for general business applications, but it might prove on the slow side for editing video segments. Professional video-editing workstations use fast SCSI hard drives for a reason.

The 7875's performance with more ordinary business apps falls between that of the Gateway Select 1100 (featuring a 1.1GHz Athlon CPU) and that of the Sys Performance 1333TD (outfitted with a 1.3GHz Athlon CPU). The 7875's nVidia GeForce2 MX 4x AGP graphics card performs acceptably for most tasks, including some games, but if you're serious about gaming or otherwise require excellent 3D performance, it will disappoint.

The mx90 display that HP included with our evaluation unit is a bright 19-inch monitor that's a pleasure to use. (HP sells the CPU separately from the display; you can instead opt for the 17-inch mx70, which knocks $150 off the total price.) HP includes a set of Polk Audio speakers that snap onto the sides of the monitor. They deliver functional PC sound, but, like many PC speakers, they won't inspire you to hock your stereo.

Though our 7875 came packed with components, the easy-open case still had ample room inside for free-flowing ventilation. Even with the free space, however, the case offers few options for growth. Its two 5.25-inch bays hold a 16x DVD-ROM and an 8x/4x/32x CD-RW drive. As configured, only a single 3.5-inch internal drive bay remained empty. Most users will find the 80GB hard drive more than sufficient, and the single extra bay could hold another one if needed. Of the board's three PCI slots, only one was available for expansion; the others held a 56kbps modem and an IEEE 1394 card. With four USB and three IEEE 1394 ports, however, the presence of only one vacant PCI slot is not as much of a problem for most users as it might have been previously.

The 7875 comes with only 128MB of PC1600 DDR SDRAM, and only two DIMM sockets. The Asus motherboard supports up to 1GB of RAM, but you'd have to take out the existing RAM to reach that total. We would have liked to have seen a minimum of 256MB of RAM standard in a PC that costs more than $2,000.

We liked the features of the USB Internet keyboard, particularly its volume control and one-touch Internet keys, but typing on it for extended periods wasn't particularly comfortable because the wrist rest seemed too shallow to provide adequate support. HP's scrolling optical mouse worked well and was pleasant to use.

The 7875's return-to-depot warranty is limited to one year of parts-and-labor coverage, which is standard on home systems. Technical support is another matter: Although help is available 24 hours a day, it's not a toll-free call. At least HP pays for shipping, should you need to send the unit in for repair.

The HP Pavilion 7875 is an able system with a feature set that, apart from its graphics subsystem, should more than satisfy most home users. But given its price and performance compared with some of the 1.3GHz Athlon systems on the market, we're just not convinced it's a good value.

—*Matthew Klare*

EDITORS' RATING 6.8

RATED 1 TO 10

DESIGN	7
EASE OF USE	7
FEATURES	8
PERFORMANCE	6
SERVICE AND SUPPORT	8
VALUE	5

Front-panel ports galore; roomy hard drive; both CD-RW and DVD-ROM drives; IEEE 1394 card and video-editing software

Poor graphics performance for its CPU class; limited interior expandability; basic speakers

DIRECT PRICE: $2,048

AS TESTED: 1.3GHz Athlon; 128MB PC1600 DDR SDRAM; 80GB hard drive; 16x DVD-ROM drive; 8x/4x/32x CD-RW drive; Asus AGP-V7100/T graphics card with 32MB DDR SDRAM; 19-inch HP mx90 monitor; Crystal WDM sound codec; two Polk Audio Model E speakers; Smart/Lucent Cheetah V.90 modem; integrated 10/100mbps Ethernet; Windows Me; Microsoft Works 2000; additional software

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DESKTOPS

POLYWELL POLY 880K7-1400

Seize a Silver SOHO Speedster

POLYWELL COMPUTERS COMBINES GOOD LOOKS AND BRAINS IN ITS $2,888 Poly 880K7-1400. This stylish silver system, targeted at small- and home-office users, mixes the power of a 1.4GHz AMD Athlon processor with 512MB of DDR SDRAM, dual 40GB hard drives in a RAID 0 configuration, and a GeForce3-powered graphics card. That recipe provides a performance jump on our office-app tests over 1.3GHz Athlon systems we've looked at, and even approaches the punch of 1.7GHz Pentium 4 computers.

The Poly 880K7-1400's overall performance is also impressive, earning a BAPCo SYSmark 2001 rating of 163. That's about 10 percent higher than the scores of top-rated 1.3GHz Athlon systems and only a few percentage points shy of the top mark hit by a Pentium 4 computer thus far. Its Internet Content Creation score of 165 is no slouch either, and it earned a high Office Productivity mark of 161, as well.

In its favor, the Poly 880K7-1400 was tested with nVidia's latest GeForce3 graphics driver, while our comparison systems used an earlier driver and GeForce2 cards. But on the downside, Polywell equipped the PC with a 3Ware RAID 0 controller that's only Ultra ATA/66-compatible, despite the pair of 40GB 7,200rpm Ultra ATA/100 Western Digital hard drives. We suspect the controller choice had a negative impact on the computer's overall performance. We'd suggest switching to a Promise Ultra ATA/100 SuperTrak controller, an option available from Polywell, to enhance the system's disk operations.

You won't want to swap out the Poly 880K7-1400's display, however. It's odd to describe a 19-inch monitor as petite, but the ViewSonic GS790 packs an 18-inch viewing area into roughly the same footprint as most 17-inch monitors. The 0.22mm horizontal dot pitch practically guarantees superb graphics. Video playback was excellent, and while we don't normally associate video with a business-oriented PC running Windows 2000, times change. With a little help from a Toshiba DVD drive, the MPEG-decoding skills of the system's WinFast graphics card, and Leadtek's WinFast DVD-playback software, Windows 2000 becomes a very entertaining environment.

But keep in mind that the Cambridge PCWorks speaker system, although quite good for two satellites and a subwoofer, and more than sufficient for business use, would be marginal accompanying a home-entertainment computer. Still, it's much more than you'll find with most business systems.

Polywell has stuffed the Poly 880K7-1400 with two rear-mounted IEEE 1394 (FireWire) ports and Pinnacle Systems' Studio DV video-capture and -editing software. If you have an IEEE 1394-equipped video camera, you're practically on your way to the Oscars. Studio DV is incredibly simple to use, featuring drag-and-drop video-clip assembly with voice-over capability and a variety of transitional elements. When you're done, send copies to your friends and family, compliments of the Plextor CD-RW drive. Lotus SmartSuite Millennium Edition is included, as well.

Polywell's 17.5-by-8-by-19-inch aluminum midtower case has the look of stainless steel with faux carbon-fiber trim at the top. It offers tool-free entry and features thumbscrews on the interface-card cage as well. There's plenty of drive-expansion room in this 10-bay case, even with half the bays already occupied. Polywell has stocked the interior with enough interface cards to leave only one PCI slot vacant, and the included 512MB of RAM fills both of the DDR-memory slots, so if you ever want to increase system memory to the 2GB maximum, you'll have to replace the RAM in the sockets. If you'll need more than 512MB of memory, order it up front.

The Poly 880K7-1400 includes a three-year parts and five-year labor warranty, which features depot repair with shipping costs split between you and Polywell. We'd strongly suggest considering the optional onsite-warranty plan, available for $75 per year for up to three years. Although you can call Polywell during business hours for technical support for the lifetime of the computer, the system includes one year of 24/7 toll-free support supplied by a third party.

With its excellent video performance and stylish looks, the Polywell Poly 880K7-1400 is more business-casual than buttoned-down. Touted as a workstation and equipped with both a modem and a LAN adapter, it doesn't need a network to be a productivity tool. Although it's priced for the upper end of the SOHO market, the system would also fit into a professional's arsenal, whether at home or at work.

—Bill O'Brien

EDITORS' RATING 7.7

RATED 1 TO 10

DESIGN	8
EASE OF USE	7
FEATURES	9
PERFORMANCE	8
SERVICE AND SUPPORT	6
VALUE	8

Solid performance; short-depth 19-inch monitor; DVD playback and video capture

Ultra ATA/66, not Ultra ATA/100, IDE controller

DIRECT PRICE: $2.888

AS TESTED: 1.4GHz Athlon; 512MB PC2100 DDR SDRAM; dual 40GB hard drives in a RAID array; 16x/10x/40x CD-RW drive; 16x DVD-ROM drive; LeadTek WinFast GeForce3 TD graphics card with 64MB DDR SDRAM; 19-inch ViewSonic GS790 monitor; Creative Labs Sound Blaster Live 5.1 sound card; Cambridge PCWorks satellite/subwoofer speakers; V.90 modem; 10/100mbps Ethernet card; Windows 2000; Lotus SmartSuite Millennium Edition; additional software

COMPANY:
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DESKTOPS

SONY VAIO DIGITAL STUDIO PCV-RX490TV

This Video VAIO's More Style Than Substance

SONY ELECTRONICS TARGETS EXPERIENCED VIDEO EDITORS AND determined dabblers alike with its $3,599 VAIO Digital Studio PCV-RX490TV. From its list of specs, the system sounds like a grand slam for PC video work, packing a superfast 1.7GHz Pentium 4 CPU, a huge video-oriented software bundle, and leading-edge storage options. But looking a bit deeper, we found that this pricey PC ultimately ends up doing both types of user a disservice.

For couch potatoes, the system offers built-in personal video recorder (PVR) capabilities. Simply connect your cable feed to the system, tell it your location, and you're ready to start recording all your favorite TV shows with Sony's Giga Pocket software and the free Web-based program schedule. Budding videographers can hook up their i.Link (IEEE 1394/FireWire) digital videocameras, create and edit movies (using Adobe Premiere LE or one of the many other video-editing packages on the system), then burn them to a DVD using the DVD-RW drive.

Setting up the 14.5-by-8.1-by-4.5-inch microtower chassis is easy, thanks to clearly marked ports in back and front. In addition to one i.Link and two USB ports, the front of the system has S-Video-in, composite-video-in, and two-channel-audio ports. On the inside, space is tight, but the easily detached power supply makes it a snap to top off the memory or add cards to the two empty PCI slots. There's only 128MB of expensive RDRAM onboard—we'd have preferred to see at least 256MB in a $3,599 PC intended for video editing, but that would have driven the price up even more. The system does come ready to communicate right out of the box with both a V.90 modem and a 10/100mbps Ethernet card.

The only monitor designed to match the VAIO's signature gray-and-purple case is the PCVA-15DX2, a 15-inch LCD monitor which, because of its smallish size and LCD technology, is unsuited for video work (not to mention that it's highly overpriced at $999.99). If you do like the system and want to buy a Sony CRT monitor instead, we suggest the CPD-E400, a 19-inch flat-screen Trinitron that costs $500 less and will deliver a better video experience.

The system falls short for video in other ways, too. We assume that people gung-ho enough to record TV programs, edit video, and burn DVD discs on their computer will also want to play DVDs on the system. If so, they'll be disappointed with the audio, because the system's lame integrated stereo sound and subpar speakers are a far cry from a solid surround-sound system.

Then there's the roomy but poky 80GB hard drive. This PC is the first we've seen that pairs a 5,400rpm drive with a Pentium 4 processor, and the benchmark results show why it's such a rarity. The system clocks in as one of the slowest 1.7GHz Pentium 4s we've tested so far, and it's even challenged by speedy 1.3GHz Athlons we've seen. The VAIO PCV-RX490TV scored only a 138 on BAPCo SYSmark 2001's overall rating, with an Internet Content Creation score of 154 and an Office Productivity rating of 123. And even with its custom MPEG-2 hardware codec, it can't keep up with the other Windows Me-based computers in encoding performance, achieving only 41.9 frames per second. Poor hard drive throughput and modest MPEG-2 encoding scores are two big strikes against a video-centric system.

Technical support is both toll-free and available around the clock, but the warranty and the free support last just one year—and the warranty is reduced to only 90 days if you fail to register your system.

Even discounting the monitor, the Sony VAIO Digital Studio PCV-RX490TV costs too much, given the poor audio and hard disk subsystems. Its only major benefit is that it's ready for PVR right out of the box. But if you're willing to do it yourself, you can buy a much faster, less expensive system from another maker and equip it with an ATI All-in-Wonder Radeon card that provides the same features.

—Lori Grunin

EDITORS' RATING 6.8

RATED 1 TO 10

DESIGN	8
EASE OF USE	8
FEATURES	8
PERFORMANCE	6
SERVICE AND SUPPORT	5
VALUE	6

Comprehensive software bundle; excellent I/O-port configuration; great video features

Expensive; subpar audio components; slow hard drive

DIRECT PRICE: $3,599

AS TESTED: 1.7GHz Pentium 4; 128MB 800MHz RDRAM; 80GB hard drive; 2x (DVD-R write), 1x (DVD-RW write), 40x (CD read) DVD-RW drive; Asus AGP-V7100 graphics card with 32MB SDRAM; 15-inch Sony PCVA-15DX2 LCD monitor; SoundMax integrated audio; Sony VAIO PCVA-SP2 two-piece speaker system; Lucent V.90 modem; Realtek 10/100mbps network card; Windows Me; Microsoft Word 2002; additional software

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HARDWARE

NIKON COOLPIX 995

A Solid Snapshooter Shows Its Age

MAYBE WE'RE GETTING JADED, BUT THE POPULAR Nikon Coolpix 900 series seems in need of a refresh. The latest entry, the $899.95 Coolpix 995, is a serviceable digital camera, but it looks a little old compared with its competitors. Plus, the interface remains too complicated and, under certain conditions, image quality has actually deteriorated compared with earlier models.

The Coolpix 995 retains the most distinguishing and impressive characteristic of the 900 series, a two-part body that lets you swivel the lens separately from the LCD viewfinder. It offers 3.34-megapixel resolution with an optical zoom range equivalent to 38mm to 152mm on a 35mm camera. Unfortunately, it also retains the series' convoluted interface that either requires you to scroll through menus for some important features, such as white balance, or use cryptically labeled buttons on the camera itself.

Automatic white balance under indoor and low lighting is poor, with a strong red cast. In bright conditions, highlights frequently blow out, and pictures tend to show chromatic aberration and blooming, especially on compressed images.

Under most other circumstances, however, image quality is quite good; pictures are sharp, noise-free, and well-exposed. As with previous models, the camera tends toward a slight underexposure that produces saturated colors; you get tons of settings to tweak exposure, saturation, contrast, and white balance. The images reproduced well on an Epson Stylus Photo 1280 printer.

A pop-up flash is new to this model, and it exposed admirably regardless of how close we got to the subject. Also, this camera is the first we've seen to implement white-balance bracketing, useful for fine-tuning how cool or warm you want your photos. The camera ships with a rechargeable lithium-ion battery, but it can also run off a standard 2CR5 lithium camera battery.

We like the swivel design, but inconsistent image quality and a confusing interface detract from the Nikon Coolpix 995's desirability.

—*Lori Grunin*

EDITORS' RATING 7.2

RATED 1 TO 10

DESIGN	8
EASE OF USE	6
FEATURES	8
IMAGE QUALITY	7
PERFORMANCE	7
VALUE	7

Excellent close-up focus distance; packed with features; white-balance bracketing

Convoluted interface; inconsistent image quality

LIST PRICE: $899.95

COMPANY: Nikon
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CANON S600 COLOR BUBBLE JET PRINTER

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DESIGNED FOR FAST, HIGH-QUALITY PERFORMANCE, Canon U.S.A.'s $199 S600 Color Bubble Jet Printer claims impressive print speeds of 15 pages per minute (ppm) for black-text printing and 10ppm for color output, numbers that are exaggerated but do reflect the printer's fast output. Benefiting from Canon's many years of printer experience, the S600 installs seamlessly and quickly, too. It took us less than 10 minutes to go from box to power-up.

One improvement over previous Canon inkjets is the S600's use of a single printhead for the black and color ink tanks. The single-head design enhances performance, because keeping track of fewer components frees up printer resources for faster processing. Changing ink tanks requires simply flipping up a lever and swapping out whichever of the four ink tanks you wish. You can also pull the whole printhead out, tanks and all, if a thorough cleaning is in order.

The S600 performs on a level with other Bubble Jet printers when printing black text, producing printed pages at just over 7ppm, but the screaming speed is most evident with color printing. The S600 churned out draft-quality PageMaker newsletters at over 3.5ppm, with quality virtually indistinguishable from that of prints produced using the default or highest resolution settings.

Photoshop images took just over a minute per page in the highest resolution mode, producing saturated color and flawless blending even across large, ink-rich pictures. Overall, the S600 generates color images at speeds up to twice those of printers such as Hewlett-Packard's DeskJet 990Cse and even Canon's own S450.

Speed and quality are the Canon S600 Color Bubble Jet Printer's strong points. It's a bit pricey for students and some family shoppers, but if you need sharp color prints that push the speed limit of inkjet technology, the output's worth the outlay. —*Phil Lacefield Jr.*

EDITORS' RATING 7.6

RATED 1 TO 10

FEATURES	7
OUTPUT QUALITY	8
PAPER HANDLING	7
PERFORMANCE	9
VALUE	7

Sharp, clear photo prints; quick text performance

Somewhat pricey

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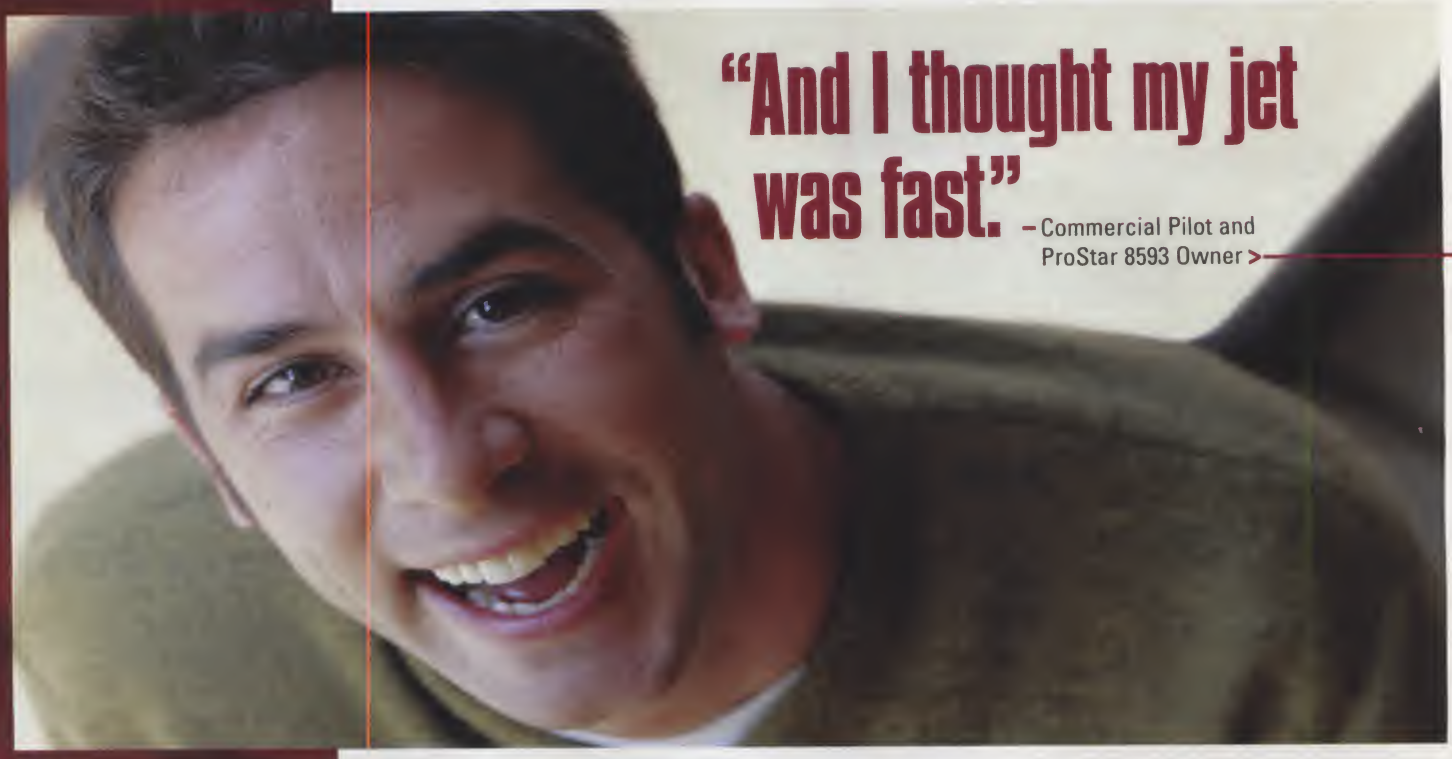

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> 3D Surround Sound with Hardware Wavetable
> 2 Built-In Stereo Speakers and 1 Built-In Microphone
> Built-In Touchpad Pointing Device
> 2 Type II or 1 Type III PCMCIA Slots
> 10/100 Ethernet Lan Adapter
> 56K Capable[3] V90 Modem
> 75.6w Smart Lithium-Ion Battery
> Infra Red, Wireless Fast IR Interface
> 1 IEEE 1394 Port & 1 Video-In Port
> 2 USB Ports & 1 TV-Out Port
> Other Ports: 1S, 1P, Ext. Keyboard and Ext. CRT
> Jacks: 1 Line-In, 1 Line-Out and 1 Microphone
> Microsoft® Windows® ME
> Carrying Case and AC Adapter

15" SXGA+ Active Matrix Display
Intel® Pentium® III Processor 933MHz
128MB 133MHz SDRAM expandable to 512MB
10.0GB Hard Drive[4]
8X[1] Max. DVD-ROM Drive (CD-RW opt.)

$1875

15" SXGA+ Active Matrix Display
Intel® Pentium® III Processor 1.0GHz
256MB 133MHz SDRAM expandable to 512MB
30.0GB Hard Drive[4]
8X[1] Max. DVD-ROM Drive (CD-RW opt.)

$2095

2253

Common Features

> 256KB On-Die L2 Cache
> Integrated Ultra AGP Graphics (4x AGP Performance) with 64MB Max. User Definable Share Memory Architecture
> 10.0GB, 20.0GB, or 30.0GB Hard Drive opt.
> 3.5" 1.44MB FDD
> 3D Surround Sound
> 2 Built-In Stereo Speakers and 1 Built-In Microphone
> Built-In Touchpad Pointing Device
> 1 Type II PCMCIA Slot
> 56K Capable[3] V90 Modem + 10/100 Ethernet
> Infra Red, Wireless Fast IR Interface
> 3 Hot Keys for E-Mail, Browser and API
> 1 IEEE 1394 Port
> 2 USB Ports & 1 TV-Out Port
> Other Ports: 1P, Ext. Keyboard and Ext. CRT
> Jacks: 1 Headphone and 1 Microphone
> Microsoft® Windows® ME
> Carrying Case and AC Adapter
> Slim Notebook: 12.1"w x 10.0"d x 1.48"h

14.1" XGA Active Matrix Display
Intel® Pentium® III Processor 1.0GHz
128MB 133MHz SDRAM expandable to 512MB
20.0GB Hard Drive[4]
24X[2] Max. CD-ROM Drive (8X[1] Max. DVD opt.)

$1475

14.1" XGA Active Matrix Display
Intel® Pentium® III Processor 1.0GHz
256MB 133MHz SDRAM expandable to 512MB
20.0GB Hard Drive[4]
8X[1] Max. DVD-ROM Drive (CD-RW opt.)

$1595

2253

Common Features

> 256KB On-Die L2 Cache
> Integrated Ultra AGP Graphics (4x AGP Performance) with 64MB Max. User Definable Share Memory Architecture
> 10.0GB, 20.0GB, or 30.0GB Hard Drive opt.
> 3.5" 1.44MB FDD
> 3D Surround Sound
> 2 Built-In Stereo Speakers and 1 Built-In Microphone
> Built-In Touchpad Pointing Device
> 1 Type II PCMCIA Slot
> 56K Capable[3] V90 Modem + 10/100 Ethernet
> Infra Red, Wireless Fast IR Interface
> 3 Hot Keys for E-Mail, Browser and API
> 1 IEEE 1394 Port
> 2 USB Ports & 1 TV-Out Port
> Other Ports: 1P, Ext. Keyboard and Ext. CRT
> Jacks: 1 Headphone and 1 Microphone
> Microsoft® Windows® ME
> Carrying Case and AC Adapter
> Slim Notebook: 12.1"w x 10.0"d x 1.48"h

13.3" XGA Active Matrix Display
Intel® Pentium® III Processor 933MHz
128MB 133MHz SDRAM expandable to 512MB
10.0GB Hard Drive[4]
24X[2] Max. CD-ROM Drive (8X[1] Max. DVD opt.)

$1345

13.3" XGA Active Matrix Display
Intel® Pentium® III Processor 1.0GHz
128MB 133MHz SDRAM expandable to 512MB
10.0GB Hard Drive[4]
8X[1] Max. DVD-ROM Drive (CD-RW opt.)

$1475

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2893

Common Features
> 256KB On-Die L2 Cache
> 2X AGP 8MB ATI Rage Pro 3D Video
> 10.0GB or 20.0GB Hard Drive opt.
> 3.5" 1.44MB Flappy Disk Drive
> 3D Surround Sound
> 2 Built-In Stereo Speakers and 1 Built-In Micraphane
> Built-In Touchpad Painting Device
> 1 Type II PCMCIA Slot
> 10/100 Ethernet Lan Adapter
> 56K Capable[3] V90 Modem
> Smart Lithium-Ion Battery
> Infra Red, Wireless Fast IR Interface
> 2 USB Ports
> Other Ports: 1S, 1P, Ext. Keyboard and Ext. CRT
> Jacks: 1 Line-In, 1 Line-Out and 1 Micraphone
> Microsoft® Windows® ME
> Carrying Case and AC Adapter
> Slim Notebook: 12.8"w x 10.15"d x 1.49"h

15" XGA Active Matrix Display
Mobile Pentium® III Processor 650MHz
Featuring Intel® SpeedStep™ Technology
128MB 100MHz SDRAM expandable to 512MB
10.0GB Hard Drive[4]
24X[2] Max. CD-ROM Drive (8X[1] Max. DVD opt.)

$1595

15" XGA Active Matrix Display
Mobile Pentium® III Processor 800MHz
Featuring Intel® Speed Step™ Technology
256MB 100MHz SDRAM expandable to 512MB
20.0GB Hard Drive[4]
8X[1] Max. DVD-ROM Drive

$1895

2293

Common Features
> 128KB On-Die L2 Cache (Intel® Celeron™ Processor)
> 256KB On-Die L2 Cache (Intel® Pentium® III Processor)
> Integrated Ultra AGP Graphics (4x AGP Performance) with 64MB Max. User Definable Share Memory Architecture
> 10.0GB, 20.0GB, or 30.0GB Hard Drive opt.
> 3.5" 1.44MB FDD
> 3D Surround Sound
> 2 Built-In Stereo Speakers and 1 Built-In Micraphone
> Built-In Touchpad Pointing Device
> 1 Type II PCMCIA Slot
> 56K Capable[3] V90 Modem + 10/100 Ethernet
> Infra Red, Wireless Fast IR Interface
> 3 Hot Keys for E-Mail, Browser and API
> 2 USB Ports
> Other Ports: 1S, 1P, Ext. Keyboard and Ext. CRT
> Jacks: 1 Headphone and 1 Microphone
> Microsoft® Windows® ME
> Carrying Case and AC Adapter
> Slim Notebook: 12.1"w x 10.0"d x 1.48"h

13.3" XGA Active Matrix Display
Mobile Pentium® III Processor 650MHz
Featuring Intel® SpeedStep™ Technology
128MB 100MHz SDRAM expandable to 512MB
10.0GB Hard Drive[4]
24X[2] Max. CD-ROM Drive (8X[1] Max. DVD opt.)

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14.1" XGA Active Matrix Display
Mobile Pentium® III Processor 800MHz
Featuring Intel® Speed Step™ Technology
128MB 100MHz SDRAM expandable to 512MB
20.0GB Hard Drive[4]
8X[1] Max. DVD-ROM Drive (CD-RW opt.)

$1595

5190

Common Features
> 128KB On-Die L2 Cache (Intel® Celeron™ Processor)
> 256KB On-Die L2 Cache (Intel® Pentium® III Processor)
> Integrated Ultra AGP Graphics (4x AGP Performance) with 64MB Max. User Definable Share Memory Architecture
> 10.0GB, 20.0GB, or 30.0GB Hard Drive opt.
> 3.5" 1.44MB FDD
> 3D Sound Effect
> 2 Built-In Stereo Speakers and 1 Built-In Micraphane
> Built-In Touchpad Pointing Device
> 1 Type II PCMCI2A Slot
> 10/100 Ethernet Lon Adapter
> 56K Capable[3] V90 Modem
> Infra Red, Wireless Fast IR Interface
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> Other Ports: 1S, 1P, Ext. Keyboard and Ext. CRT
> Jacks: 1 Headphone and 1 Micraphane
> Microsoft® Windows® ME
> Carrying Case and AC Adapter
> Super Slim Notebook: 11"w x 9.4"d x 1.5"h

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128MB 100MHz SDRAM expandable to 512MB
10.0GB Hard Drive[4]
24X[2] Max. CD-ROM Drive (8X[1] Max. DVD opt.)

$1095

12.1" XGA Active Matrix Display
Mobile Pentium® III Processor 600MHz
Featuring Intel® Speed Step™ Technology
128MB 100MHz SDRAM expandable to 512MB
10.0GB Hard Drive[4]
8X[1] Max. DVD-ROM Drive (CD-RW opt.)

$1295

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HARDWARE

POLK AUDIO AMR150

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ZDNet BEST BUY

CAN A SET OF MULTIMEDIA SPEAKERS RIVAL standard home audio speakers in sound quality? You'll think so once you listen to the astounding Polk Audio AMR150 four-channel system.

The $149.95-direct AMR150 is Polk Audio's multimedia flagship, consisting of four satellites and a subwoofer module. The two-tone gray satellites (also available in black) have an attractive slope-back design. The right front satellite has a power switch that also controls volume and surround-sound level; this satellite is also equipped with separate bass and treble controls. The subwoofer module has power and subwoofer-level controls on its front, and analog and digital hookup jacks at the rear. No surround-sound decoder is built in, however.

The front satellites each include a 3-inch midrange driver and a 1.5-inch tweeter. The rear satellites each contain a single 3-inch speaker that handles the full frequency range. The 8-inch-high subwoofer module has a 4-inch speaker, which, though it may seem small, more than gets the job done. Polk rates the system for a frequency range of 38Hz to 20,000Hz.

We tested the system with the two-channel output of an Apple Power Macintosh G4, as well as the surround sound produced by the new Mac version of Creative Labs' Sound Blaster Live. You'll need to spend a few moments adjusting the subwoofer-level control to find the point at which the output from the subwoofer just becomes audible. Once you do, the magic happens. Highs are crisp and clean, voices are warm and natural, and bass is solid. You'll hear none of the thumping that passes for bass with lesser speakers.

The package includes all the color-coded connection cables you'll need. We wish that a better set of instructions was included than the single sheet that passes for a manual, however.

It's priced near the top end for multimedia speakers, but the Polk Audio AMR150 is a first-rate system that delivers an extraordinarily satisfying listening experience.

—Gene Steinberg

EDITORS' RATING 8.5

RATED 1 TO 10

DESIGN	9
FEATURES	7
SOUND QUALITY	9
VALUE	9

Great bass, warm midrange, crisp treble; reasonable price; comprehensive controls

Too-brief setup sheet; no built-in surround-sound decoder

DIRECT PRICE: $149.95

COMPANY: Polk Audio
Baltimore, MD
800-377-7655, 410-358-3600
www.polkaudio.com

ZDNet Price It! 34602

For real-time pricing, go to *priceit.zdnet.com* and enter number.

PERCEPTION DIGITAL PDHERCULES DIGITAL JUKEBOX

Move Your Stereo Into the MP3 Age

NOT LONG AGO, ENJOYING DIGITAL MUSIC MEANT listening to MP3 files on a computer or a handheld portable player. Today, you have an increasing number of alternatives, which include MP3 CD players, home-networked digital-music receivers, and even car stereos that play digital audio. One new offering is Perception Digital's $699 PDHercules Digital Jukebox, a home-stereo MP3 player equipped with a CD drive, a SmartMedia-card slot, and an 18.6GB hard drive. Despite some glaring flaws, this device provides easy living-room access to downloaded digital music.

The internal drive holds more than 300 hours of 128kbps MP3s that it can rip from audio and MP3 CDs, record from external analog input, download from a PC through a parallel connection (an optional USB adapter is planned), or load from a SmartMedia card. Most features must be accessed from a clunky wireless remote that's cluttered with more than 20 function keys, a cursor pad, a seven-line LCD, and a full QWERTY keyboard.

The unit can record individual CD tracks or an entire disc to its hard drive at 6x speed. Each track can be named automatically if your disc is listed in the 10,000-album onboard database; a bundled utility lets you download track and artist data for hundreds of thousands more.

The PDHercules is far from perfect. It can't recognize ID3 tags in files transferred from a PC, and usability is hampered by the remote's microscopic keys and maddeningly slow infrared connection. Worse, the device's file-transfer functions work in only one direction, making it impossible to load music onto a SmartMedia card or send files to a PC. And most of the PDHercules' onboard digital effects sound terrible.

The Perception Digital PDHercules Digital Jukebox could be a handy addition to many living rooms. But we can't give it an unconditional recommendation until Perception Digital enhances its usability, enables bidirectional file transfers, and offers faster, preferably USB, connectivity.

—Don Labriola

EDITORS' RATING 6.3

RATED 1 TO 10

DESIGN	6
EASE OF USE	5
FEATURES	7
PERFORMANCE	6
SOUND QUALITY	7
VALUE	7

Huge storage capacity; high-speed one-click MP3 recording; accepts SmartMedia cards; automated artist and track-title data entry

Cumbersome remote; slow response over infrared connection; supports MP3 file format only; can't export songs to PC or SmartMedia card

DIRECT PRICE: $699

COMPANY:
Perception Digital
Kowloon, Hong Kong
011-852-2269-1000
www.pdhercules.com

ZDNet Price It! 34605

For real-time pricing, go to *priceit.zdnet.com* and enter number.

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Editors' Choice
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RS6000-June 2000

TOP 5 Home PCs
FORTUNE TECHNOLOGY REVIEW
X7000-July 2001
RS6000-July 2001

COMPUTER SHOPPER Best Buy
XS5000-July 2001
AS5000-July 2001
AS9800-January 2000

ZDNet BEST BUY
XS5000
AS5000

CNET Editors' TOP 5 CHEAP PCs
PS5000
RS6000

CNET Editors' TOP 5 BUSINESS PCs
RS6000

VS8000

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- Nvidia GEFORCE 2 MX DVD 3D 64MB
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- NEC Accusync AS70 17" 0.27dp Monitor
- SoundBlaster SB16 128V PCI 3D Wavetable
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- Sun Micro StarOffice Application Suite
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New Athlon™ w/Enhanced Cache at 1.5 GHz **$1,259** V3906

AMD Duron™ Processor
850 MHz **$1,109** V3901 — 900 MHz **$1,119** V3902
950 MHz **$1,129** V3903

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1.1GHz (266MHz) **$1,149** V3904 — 1.2GHz (266MHz) **$1,159** V3905
1.3GHz (266MHz) **$1,199** V3906 — 1.4GHz (266MHz) **$1,219** V3907

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HARDWARE

SONY SDM-M51/B

LCD Sleekness With Video Weakness

SONY ELECTRONICS' $599.99 SDM-M51/B LCD monitor presents two very different faces to two types of buyer. Business-application users will find this 15.1-inch display offers excellent image quality, particularly for an analog-only LCD monitor, at its native and maximum resolution of 1,024 by 768. Gamers and video mavens, on the other hand, will be frustrated by lost detail in dark areas and unhappy with the tinny-sounding built-in speakers.

Sony claims the SDM-M51/B has a no-footprint design, but that's true only if you're mounting it on a wall. Nonetheless, the SDM-M51/B is one of the sleekest-looking LCDs we've seen.

Connectivity features are minimal: The unit has a headphone jack, but no USB ports. Setup is as easy as plugging in video, audio, and power cables, then snapping on the back cover to hide the connectors from view. The base allows you to adjust tilt and height.

Unfortunately, image setup isn't as easy as the physical setup. The autoadjust feature didn't work on our test unit. The manual controls are convenient to operate, however, making this a minor problem. The settings menu is easy to navigate, and the control buttons are well-marked.

We tested the monitor with our standard test suite, including DisplayMate *(www.displaymate.com)*, which offers a set of images designed to expose image flaws. The SDM-M51/B's image ranged from good to excellent at 1,024 by 768. We saw no jitter and no sign of streaking or ghosting. Focus was sharp, colors were well-saturated, and text was crisp at sizes down to 6.8 points.

In adjusting brightness and contrast, however, we had to choose between losing some dark shades or some light shades. Choosing to lose the dark shades worked well for business applications, but it turned dark scenes in adventure-style games pitch black.

The Sony SDM-M51/B is an acceptable performer, but other LCD monitors, notably the IBM T540, offer better image quality and easier setup for about the same price.

—M. David Stone

EDITORS' RATING 6.6

RATED 1 TO 10

DESIGN	8
FEATURES	7
IMAGE QUALITY	6
SETUP	6
VALUE	6

Good image quality for business apps; sleek design; easy-to-use menus and controls; headphone jack

Autoadjust feature didn't work in our tests; image loses too many shades for some apps; tinny-sounding speakers

DIRECT PRICE: $599.99

COMPANY: Sony Electronics
Park Ridge, NJ; 800-222-7669
www.sel.sony.com

ZDNet Price It! 34608

For real-time pricing, go to *priceit.zdnet.com* and enter number.

NETWORKS

U.S. ROBOTICS WIRELESS ACCESS NETWORK COMBINATION SET

Do-It-Yourself Wireless Networking Done Right

THE $289.95 U.S. ROBOTICS WIRELESS ACCESS NETwork Combination Set lets you connect a notebook PC to a desktop PC for the purpose of sharing files, a printer, and an Internet connection. Don't let the word "Set" in the name fool you, however: The box contains no other hardware than two wireless LAN adapters: one PC Card and one PCI card.

Most wireless-networking kits combine two wireless adapters with a wireless access point, but U.S. Robotics is betting that many home and home-office users don't need the access point—they just want to link up a notebook and a desktop. You install the kit's PC Card adapter in your notebook and the PCI card in the desktop, linking the two in an ad-hoc wireless network. The desktop can then share its existing Internet connection using the Internet Connection Sharing software built into Windows 98 Second Edition and later versions.

Installing and setting up the adapters was straightforward—no more difficult than with competing products—but we have yet to see a truly friendly installation document accompany a wireless kit of any kind. The adapters' default settings allowed them to find each other immediately. Once we set the drives and folders for sharing, files transferred as quickly as with any other 802.11b networking product, up to 1.5MB per second in our tests. Internet sharing functioned flawlessly, as well, with the desktop machine acting as the sharing server.

The U.S. Robotics Wireless Access Network Combination Set isn't cheap, especially for home or home-office use, but the price isn't out of line for current wireless products, and buying the adapters separately from U.S. Robotics would cost about $40 more. If you need to network a desktop and a notebook PC wirelessly, this kit should be a strong contender for your dollars.

—Neil Randall

EDITORS' RATING 7.0

RATED 1 TO 10

DESIGN	7
FEATURES	8
INSTALLATION	6
VALUE	7

Well-suited for a small desktop-notebook wireless network; adapters designed to work together on installation; consistent transfer speed

No easy-setup card or paper manual

DIRECT PRICE: $289.95

COMPANY: U.S. Robotics
Schaumburg, IL; 877-710-0884
www.usr.com/wireless

ZDNet Price It! 34609

For real-time pricing, go to *priceit.zdnet.com* and enter number.

SECTION CONTINUES ON PAGE 78

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MOBILE

SONY VAIO PCG-R505TE SUPERSLIM PRO

The Pint-Size King of Digital Video

THE $2,999 SONY VAIO PCG-R505TE SUPERSLIM PRO NOTEBOOK provides an excellent example of why you should sometimes look past performance ratings and technical specifications when buying a notebook. Its standout specifications are its minimal size and weight, but this slim notebook also has an excellent software bundle aimed at hobbyist photographers and videographers who will find it worth sacrificing a few benchmark points.

The VAIO PCG-R505TE is compact and light at 1.5 inches thick and a mere 4.5 pounds with the AC adapter. Despite its subnotebook size, the VAIO is plenty powerful, packing a 750MHz SpeedStep Pentium III processor. Overall, the notebook feels responsive, and its magnesium case makes it quite sturdy as well.

It does disappoint in the 3D-graphics arena, however, because it uses the weak 3D support built into its Intel 815E motherboard chipset instead of a dedicated graphics chip. Battery life is mediocre at 2 hours and 33 minutes in our tests, despite Sony's rating of 3 to 4.5 hours. Still, battery life is much better than that of the previous SuperSlim model. A double-capacity battery is available as an option.

Sony bundles a number of media-management apps clearly aimed at casual and hobbyist users, with sleek and easy-to-use interfaces that have a unique look styled after the company's consumer-electronics devices. These programs include the Media Bar multimedia player, PictureGear graphics manager, Sony DVgate video editor, and Easy Systems' Drag 'n Drop CD-burner software. All of these apps share a similar user interface, and though they're not exactly high end, they offer plenty of power for the average home or small-business user dabbling in digital photography and DV editing.

When manufacturers try to enhance the Windows interface, it usually results in gimmicky and obtrusive software. Not so here. You pull up Sony's custom launcher application via a jog dial set below the touch pad, and once you get the hang of it, it really does make jumping to various programs a snap. You can also use it to access notebook settings and as a scroll wheel in apps.

Along with the typical notebook expansion ports, including a pair of USB connectors, the VAIO PCG-R505TE includes a Memory Stick slot for transferring digital photos and an i.Link (IEEE 1394, also known as FireWire) port for transferring digital video. One way Sony keeps the unit's size down is by leaving out the removable-media drives. When you need to access a CD or floppy disk, just clip on the optional $499.99 SlimDock, which includes either a combo DVD/CD-RW drive, as our review unit did, or a DVD-ROM drive along with a floppy drive. The docking unit adds about an inch in thickness and 1.9 pounds in weight to the overall package. (The system itself measures 1 inch by 11 inches by 9.4 inches.)

DVD playback looked great on the smallish 12.1-inch TFT screen, but audio was disappointing. The notebook has so little room for speakers that it just doesn't put out much volume. Audio CDs played a bit louder, but they produced a lot of distortion at higher volumes. Plan on getting a pair of decent headphones if you want good audio for DVD or CD playback from this unit.

The VAIO PCG-R505TE's keyboard was comfortable, a big improvement over those of Sony's earlier slimline notebooks. The layout's reasonably well-thought-out, but dedicated page-navigation keys are missing; you'll have to use the Fn key in combination with the arrow (cursor-control) keys.

Sony offers a one-year parts-and-labor warranty, but be sure to register. If you don't, the warranty runs out after a mere 90 days. The company provides 24-hour-daily phone support, but it's free only for 90 days on the software and one year for hardware. After that you have to ante up.

The Sony VAIO PCG-R505TE SuperSlim Pro irons out most of the kinks of the company's earlier superportable notebooks. It doesn't offer standout performance or battery life, and is a bit expensive for a 750MHz notebook, but its slim and light package and useful media-creation software make it an excellent road companion for DV and digital-photography fans. —*Denny Atkin*

EDITORS' RATING 7.0

RATED 1 TO 10

DESIGN	8
EASE OF USE	8
FEATURES	8
PERFORMANCE	6
SERVICE AND SUPPORT	5
VALUE	7

Slim and very light; useful software bundle; jog-dial application launcher simplifies navigation

Weak audio; slow 3D; mediocre battery life; short warranty

DIRECT PRICE: $2,999 (WITH DOCKING STATION AND COMBO DRIVE)

AS TESTED: 750MHz SpeedStep Pentium III; 192MB 100MHz SDRAM; 15GB hard drive; combination CD-RW/DVD-ROM drive in docking station; integrated Intel 815E chipset graphics controller; 12.1-inch TFT XGA LCD; sound codec integrated into 815E chipset; twin integrated stereo speakers; integrated V.90 modem; integrated 10/100mbps Ethernet; Windows Me; additional software

COMPANY: Sony Electronics
Park Ridge, NJ
888-315-7669, 201-930-1000
www.sonystyle.com/vaio

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MOBILE

ACER TRAVELMATE 610TXVI

A Full-Featured, Bantamweight Traveler

WITH ITS SLEEK DESIGN AND CUTTING-EDGE, CORPORATE-FRIENDLY features, the $2,099 800MHz Pentium III-powered Acer TravelMate 610TXVi serves up a compelling two-spindle package that will appeal to traveling workers of all stripes. Because it features a USB-based external floppy drive, it can't serve as the all-in-one desktop-replacement system some users desire, but with a weight of only 5.1 pounds and a thickness of merely 1.3 inches, it's highly portable. Poor performance on our graphics benchmark testing was not quite enough to eclipse our sunny opinion of this notebook.

The TravelMate's all-over silver-metallic finish and simple, streamlined design give it a futuristic but understated look that business users will surely like. The aesthetic simplicity extends to the well-ordered, unadorned keyboard and bright 14.1-inch screen that greet you upon opening the case. Like the influential Apple iBook, which has dispensed with everything but the most essential and forward-thinking I/O connectors, the 610 Series notebooks feature no parallel or serial ports, opting instead for two USB and one Fast IR port. The notebook also has enough room for a single Type II PC Card slot, an internal modem, and an Ethernet port.

Connectivity is one of the areas in which the TravelMate distinguishes itself, thanks to the wireless 802.11b capability that's included as a standard feature in all 610 Series notebooks. A dedicated button above the keyboard turns the internal antenna on and off, and five programmable application/Web buttons give users quick, one-touch access to their favorite programs or Internet sites.

Another area in which the TravelMate excels is hardware-based security, thanks to its built-in smart-card reader. System administrators can use the included PlatinumSecret software utility to set up each TravelMate for access only by authorized users bearing both a hardware key (smart card) and a password. Each system can support up to four users, and the software itself supports file and folder encryption and Web authentication.

The TravelMate features integrated graphics as part of the Intel 815 chipset, which can drive external monitors at resolutions up to 1,600 by 1,200, although the 14.1-inch screen supports a maximum 1,024-by-768 resolution at 24-bit color. DVD playback looked excellent. We encountered no hiccups and relatively little pixelation in dark areas or high-motion video segments. Our Quake III demo ran at 15.5 frames per second, which isn't exactly competition-level gaming performance, but it'll do for most corporate users in a pinch. We found one dead pixel on our evaluation unit's display.

Despite its relatively solid video performance in casual use, the TravelMate fared dismally on our graphics benchmark tests. It did better on our BAPCo suite of general-processing tests, turning in scores in the low-to-mid-80s, right in line with expectations. The system's battery life of just over 3 hours is mediocre by today's standards but serviceable for most purposes. The twin integrated speakers delivered plenty of volume, but sound quality was a touch tinny.

We were more impressed with the sleek, comfortable-to-use keyboard and touch pad. Key response was better than average, and the keyboard layout was satisfactory, too, except that the inverted-T arrow keys weren't set far enough apart from the rest. The slim actuation buttons and scrolling button beneath the touch pad need a little work, however. In an effort to make them look good, Acer neglected to make them big or responsive enough.

In keeping with its overall business-friendly configuration, our TravelMate came loaded with Windows 2000. Some versions come with Microsoft Office Small Business, although ours came with no productivity software and no electronic documentation. Printed documentation was also conspicuously missing.

Acer backs its 610 Series notebooks with a standard one-year parts-and-labor warranty, which you can upgrade to three years for $198. The company doesn't offer an option for onsite service, however.

Business users and occasionally itinerant consumers will love this sleek, user-friendly notebook. Corporate users will also be drawn to features such as built-in wireless networking, smart-card hardware authentication, and Windows 2000. This sleek, lightweight two-spindle device is also a breeze to take with you on the plane, and its battery life is just long enough to let you get some serious work done. —*Asa Somers*

EDITORS' RATING 6.8

RATED 1 TO 10

DESIGN	7
EASE OF USE	7
FEATURES	8
PERFORMANCE	6
SERVICE AND SUPPORT	6
VALUE	7

Built-in smart-card and wireless-LAN capabilities; good DVD and audio playback; lightweight, slim design

Poor 3D-graphics performance; poor documentation

MFR. EST. PRICE: $2,099

AS TESTED: 800MHz SpeedStep Pentium III; 128MB 100MHz SDRAM; 20GB hard drive; 8x DVD-ROM drive; integrated Intel 815 chipset graphics controller; 14.1-inch TFT XGA LCD; integrated smart-card reader; sound codec integrated into 815 chipset; twin integrated stereo speakers; integrated V.90 modem; integrated 802.11b wireless networking; integrated 10/100mbps Ethernet; Windows 2000

COMPANY: Acer America
San Jose, CA
800-551-2237, 408-432-6200
www.acer.com

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MOBILE

COMPAQ PRESARIO 800

A Featherweight Flyer Grounded by Its Battery

THE COMPAQ PRESARIO 800 HAS JUST ABOUT ALL THE FEATURES WE look for in an ultraportable: It's thin and light, offers a full complement of I/O ports, and has a competitive price. But after testing this $2,198 unit, we think you'd be hard-pressed to get much work (or play) accomplished with it.

The Presario 800 has the dubious honor of delivering the shortest battery life we've seen in a long time: a mere 1 hour and 47 minutes. This too-brief result is even more unsatisfying when you consider this system is powered by Intel's low-voltage 700MHz SpeedStep Pentium III processor. Fortunately, you won't mind carrying the AC adapter wherever you go, since the system's total travel weight is just 4.8 pounds.

The only real benefit of the Presario 800's brief battery life is that you won't have long to deal with the frustrating way the touch-pad cursor jumps around randomly as you attempt to type. Compaq needs to correct the pad's oversensitivity, either by redesigning the hardware or developing a better driver. It's a pity, too, because the notebook is well-designed in other respects. Its magnesium case makes it plenty sturdy. Apart from the jumpy touch pad, we like the keyboard; key travel is a bit shallow, but otherwise it's eminently touch-typable. The bright 12.1-inch TFT display runs at the now-standard native resolution of 1,024 by 768, providing sharp text and relatively smooth DVD display.

Although DVDs hiccup occasionally during playback, they're certainly watchable, and the accompanying sound is good for such a small system. Compaq's partnership with JBL has led to quality sound throughout its Presario notebook line, and the payoff is especially evident in the Presario 800. The system we tested came equipped with an external 8x DVD-ROM drive, which, because it attaches via an external PCI connector, can't be hot-swapped; you've got to turn the system off before you connect it. A 24x CD-ROM drive and a 4x CD-RW drive are available as added-cost options. Also, to the keep notebook's body slim, the unit comes with an external USB floppy drive.

The microphone, headphone jack, and volume control are all easily accessible from the front, and two USB ports and an IEEE 1394 (FireWire) port join the modem, LAN, and proprietary external IDE port on the left side of the unit. We used the PC Card slot to test the optional iPaqnet Mobile Internet on Ricochet, Compaq's wireless access solution. Ricochet isn't too widely available, but if you live or work in one of the supported areas, definitely consider it. Installation and activation run smoothly, and its 128kbps speed can't be beat, except when compared with wired broadband solutions or 802.11b wireless-networking solutions.

Overall system performance, on the other hand, is just acceptable. Application test results fall somewhere in the middle of similarly configured systems (700MHz Pentium III, 128MB RAM, Windows Me), partly because only 4MB of RAM complements the Presario 800's ATI Rage Mobility-M1 graphics chipset. This memory shortfall also likely contributed to our inability to drive a large external monitor from the notebook. The 20GB hard drive is a reasonable performer, but keep in mind that Compaq splits the drive into a 16GB main partition and a 3GB backup partition, which don't add up to 20GB due to rounding and byte calculations. Still, the system has enough power for most business applications and most Web-related tasks too, unless you're doing computer animation or running high-end graphics programs. It should certainly perform well with the included apps; other than Windows Me, the only software included is Microsoft's Featured Home Collection, which includes Microsoft Works, Word, and Money.

Compaq's one-year parts-and-labor warranty is standard fare, but it lacks onsite service, even if you opt for the $99 three-year upgrade. The Presario 800's price as configured matches or beats competitors such as the Dell Inspiron 2100 and IBM ThinkPad X21, but if you're willing to gain a pound and convert to the Mac OS, you can shed hundreds of dollars by going with an Apple iBook.

A slender machine with a reasonable price and broad features, the Compaq Presario 800 has two deal-breaking flaws: its brief battery life and jumpy touch pad. If Compaq can address these shortcomings, this system could be a compelling option for frequent flyers. Until then, we recommend that you travel with another ultraportable.

—Lori Grunin

EDITORS' RATING 6.8

RATED 1 TO 10

DESIGN	6
EASE OF USE	7
FEATURES	8
PERFORMANCE	6
SERVICE AND SUPPORT	7
VALUE	7

Small and light; high-resolution display; inexpensive for an ultraportable; full-featured

Short battery life; poorly designed touch pad

DIRECT PRICE: $2,198

AS TESTED: 700MHz SpeedStep Pentium III; 128MB 100MHz SDRAM; 20GB hard drive; external 8x DVD-ROM drive; ATI Rage Mobility-M1 graphics controller with 4MB RAM; 12.1-inch TFT XGA LCD; integrated Crystal WDM sound codec; JBL Pro twin integrated stereo speakers; integrated V.90 modem; integrated 10/100mbps Ethernet; Windows Me; Microsoft Featured Home Collection

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MOBILE

TOSHIBA SATELLITE PRO 4600

A Business Battleship That's Big on Performance

EVERYTHING-BUT-THE-KITCHEN-SINK, DESKTOP-REPLACEMENT notebooks often pack prices to match their hefty feature sets, but not so with Toshiba's latest business-class unit. The $2,399 Toshiba Satellite Pro 4600 is a hefty 7.3-pound, three-spindle unit with a 15-inch screen, built-in wireless networking, a combo DVD/CD-RW drive, and plenty of firepower. Only corporate users who travel a lot would want to sacrifice this level of power and advanced features for better portability.

With an 850MHz Pentium III processor and 128MB of RAM under the hood, this system predictably sped through our performance tests. Its application scores were substantially higher than those of the similarly equipped Fujitsu LifeBook E series, although that system came loaded with Windows 98 rather than the Satellite Pro 4600's Windows 2000. (Windows 98 Second Edition is also an available option.) Battery life for this unit, given its large 4,000mAh lithium-ion cell, was disappointing at 2 hours and 41 minutes.

Measuring nearly 2 inches thick, the Satellite Pro 4600 cuts a rather portly profile, and Toshiba has gone a bit overboard in trying to disguise its girth by covering it in several shades of futuristic brushed-metal finishes.

With a gorgeous 15-inch screen combined with a Trident CyberBlade XP graphics engine and 16MB of video RAM, the Satellite Pro 4600 is an excellent platform for multimedia. Its graphics benchmark results, however, weren't up to par with those of notebooks we've seen using nVidia's GeForce2 Go or ATI's Rage 128 graphics chipsets. We were unable to run our Quake III test due to OpenGL conflicts, but historically, the CyberBlade XP chipset has disappointed in terms of 3D performance. DVD playback looked impressive and smooth, although it took a few tries for the player to recognize the test disks we routinely use.

Toshiba has certainly loaded this model for battle. With the combo DVD/CD-RW drive, fast 20GB hard drive, super-loud and surprisingly clear Yamaha sound system, and composite-video-out port, the Satellite Pro 4600 is a formidable tool for presenters on the go. With built-in 802.11b networking support and a nifty dedicated switch for turning the internal antenna on and off, it stays connected wirelessly around your corporate campus, too.

We liked the feel of this notebook's keyboard: firm and bouncy with good travel. The key layout, however, needs rethinking (especially the tiny Tab key), and the actuation buttons coupled with the AccuPoint II pointing device were too small and stiff for our tastes.

Memory can be expanded up to 512MB in two PC100 SODIMM slots. The catch, of course, is that to reach that number you'll have to forfeit the single 128MB SODIMM module occupying one of the slots as it arrives from the factory and install two 256MB modules.

Toshiba ships the Satellite Pro 4600 with McAfee ActiveShield and your choice of two products from a selection of titles, including Lotus SmartSuite. The company provided thorough printed and electronic documentation. We liked the full, Acrobat-formatted user's manual, as well as VirtualTech, a compendium of diagnostic tools and troubleshooting tips.

All Satellite and Satellite Pro models are backed with a standard one-year parts-and-labor warranty and toll-free technical support for the length of the warranty. Though the warranty is considerably less than the three years that comes standard on some Dell and Compaq corporate models, you can upgrade to three-year coverage for the Satellite Pro for $199 and three years of onsite service for $349.

With its high-end features, this model is a heavyweight in several senses of the word. It's ideally suited for the corporate grind, but it won't be much fun lugging around on business trips. The system soars to a total of 8.4 pounds when you include its alarmingly fat AC adapter.

Because of the high travel weight, frequent travelers should probably steer away from this all-in-one system in favor of a slimmer two-spindle device. Presenters on the run, however, should give it a look for its multimedia capabilities, and normally sedentary users who just want to be able to take their PC home or on an occasional trip will appreciate its power.

—Asa Somers

EDITORS' RATING 6.8

RATED 1 TO 10

DESIGN	6
EASE OF USE	6
FEATURES	8
PERFORMANCE	7
SERVICE AND SUPPORT	7
VALUE	7

Built-in wireless networking; combo DVD/CD-RW drive; solid performance

Heavy and bulky; huge AC adapter; short battery life

DIRECT PRICE: $2,399

AS TESTED: 850MHz SpeedStep Pentium III; 128MB 100MHz SDRAM; 20GB hard drive; 6x DVD, 4x/4x/24x CD-RW combo drive; Trident CyberBlade XP graphics controller with 16MB video RAM; 15-inch TFT XGA display; Yamaha YMF743 audio codec AKM4543; integrated stereo speakers; integrated V.90 modem; integrated 10/100mbps Ethernet; Windows 2000; additional software

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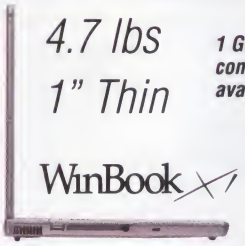

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MOBILE

ARCHOS JUKEBOX 6000

Tons of Tunes, Terrific Price

IF 64MB PORTABLE MP3 PLAYERS AREN'T PIQUING your interest, how about a 6GB device that weighs less than a pound? Archos Technology's $249 Jukebox 6000 isn't a lightweight, but it can carry hundreds of audio files and double as a portable hard drive.

The Jukebox 6000 resembles a large Walkman with a metallic finish, a rectangular shape, and blue wedges on each corner that protect the player in case you drop it. The result is a bit odd-looking, and relatively heavy at 12 ounces. Still, it's not so unwieldy that you couldn't jog with it.

The Jukebox 6000 uses a USB connection and sets itself up as a separate drive in Windows, so you can drag and drop any type of file onto its portable hard drive; the unit will play back only MP3 files, however. Archos provides Musicmatch's Jukebox software to manage your digital-audio files and let you rip MP3s from your CDs.

Sound quality is good, although we noticed slight clipping with the bass turned up. The backlit LCD shows an array of information, including battery life, volume setting, track name and number, and directory level. A dedicated button for volume would have been a big plus; instead, you have to drill down in the display navigation to reach the volume control.

Archos promises up to 8 hours of battery life from the four rechargeable nickel metal-hydride batteries built into the unit. The recharging process is lengthy (6 hours), and the Jukebox 6000 doesn't give any indication of how far along in the process it is. The headphones are run-of-the-mill wraparounds—better than earbuds, but nothing special. An FM tuner also would have been a nice touch.

The Archos Jukebox 6000 is a real bargain in an often overpriced category of products, if you consider that players with a small fraction of its capacity sell for only about $50 less. If you don't mind its bulkiness, you'll find it a great buy.

—*Sean Portnoy*

EDITORS' RATING 7.5

RATED 1 TO 10

DESIGN	7
EASE OF USE	7
FEATURES	7
PERFORMANCE	8
SOUND QUALITY	8
VALUE	8

Huge 6GB capacity; doubles as a portable hard drive; USB interface for plug-and-play support

Bulky; no dedicated volume control; no Windows Media support; lengthy battery-recharge process

DIRECT PRICE: $249

COMPANY:
Archos Technology
Irvine, CA
800-559-3605, 949-453-1121
www.archos.com

ZDNet Price It! 34610

For real-time pricing, go to *priceit.zdnet.com* and enter number.

SIEMENS S40

A Worldly Handset In an Elegant Package

SIEMENS' $379 S40 GLOBAL PHONE GIVES U.S. WIRELESS customers what the German company has been offering Europeans for years. Though the phone looks fairly basic, it's positively loaded with features.

The 3.4-ounce S40 is one of the more stylish phones on the market. Siemens has adorned the trim S40, which measures 4.4 inches by 1.7 inches by 0.9 inch, with a blue, backlit screen and buttons designed to match the translucent-blue trim.

The S40, which supports GSM 900/1800/1900, offers worldwide roaming and includes software that lets you sync with Microsoft Outlook's address book and calendar on your PC (but not the Mac). The phone records up to 5 minutes of memos and calls, and has a wireless Web browser, a calculator, and 42 ring tones. Moreover, it's data-capable and supports Short Message Service (SMS).

You can store up to 1,000 entries in the phone, as well as sync with your computer using a serial cable or wirelessly via the phone's IR port. (You can also send and receive digital business cards.) We were able to transfer 421 contacts and 14 appointments into the phone.

The S40 has several phone books that are different from your address book, including one stored on the phone's subscriber identification module (SIM) card. If you switch GSM phones, you can swap out the SIM card and still have those numbers at hand.

The S40 performs favorably compared with other GSM phones we've tested on VoiceStream's network in New York. It also operated flawlessly during informal testing in London.

Like Nokia's 8260 and 8890, this model has an internal antenna. Call quality was generally good, and we were even able to get a signal while riding a few elevators. Battery life is well above average: We managed 4.5 hours of talk time and 4.5 days of standby.

The S40 is one of the more stylish and functional GSM models available for the U.S. market. It's expensive, but it competes well against Ericsson's T28 and Nokia's pricey 8890, particularly when you consider Siemens includes the synchronizing software.

—*David Carnoy*

EDITORS' RATING 7.8

RATED 1 TO 10

ACCESSORIES	8
BATTERY LIFE/CHARGE TIME	7
FEATURES	8
LOOK AND FEEL	9
VALUE	7

Stylish; syncs with Microsoft Outlook; multiple phone books; good performance

Somewhat pricey; can't sync with a Mac

DIRECT PRICE: $379

COMPANY:
Siemens Information and Communication Mobile
San Diego, CA
800-743-6367, 858-521-3100
icm.siemens.com

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SOFTWARE

MAC OS X

A Good Apple That's Not Quite Ripe

AFTER SEEMINGLY ENDLESS DELAYS, APPLE HAS finally shipped Mac OS X. Though the new interface and underlying sophistication show quite a bit of promise, this new version didn't bowl us over.

Installation takes only 10 minutes. However, OS X won't install without Mac OS 9.1. (Apple includes an OS 9.1 CD with OS X.) Apple recommends a minimum 233MHz processor and 128MB of RAM. Our test system was a powerful dual-processor Power Mac G4 tower with 384MB of RAM and a 20GB hard drive, and while OS X wasn't slow, it wasn't overly responsive.

The actual OS X interface is beautiful and slick. Buttons are animated, menus are semitransparent, and all windows have a drop shadow. But Mac veterans will find themselves searching the Finder menus, because almost everything has been moved.

The much-discussed Dock, designed to replace the Apple and Applications menus, is a great convenience once you get the hang of it. The Dock lets you switch between programs, navigate a folder's contents, keep aliases of your apps, and jump between open documents. But we noticed several problems with the Dock. It's an application, which can crash like any other. Also, you can't tell folders apart without rolling your mouse over them, and not having visual cues makes the Dock cumbersome. Finally, the Dock grows out in both directions, which means nothing stays in the same place as you work.

The good news is that OS X finally introduces protected-mode operation and preemptive multitasking. The catch? Applications have to be rewritten to run in protected mode; most existing apps run in a "compatibility mode" called Classic.

OS X isn't really finished, and Classic mode isn't completely stable. Also, OS X doesn't support DVD playback or CD-RW, and few non-Classic applications are available. If you're an early adopter, you'll find lots to be excited about in Mac OS X, but most users will want to wait until Apple adds a little polish.

—Barry Lubov

EDITORS' RATING 6.4

RATED 1 TO 10

EASE OF USE	6
FEATURES	6
INSTALLATION	9
STABILITY	5
VALUE	6

Protected memory; beautiful, functional interface

No DVD-playback or CD-RW support; Dock needs tweaking; few OS X-native apps available yet

DIRECT PRICE: $129

REQUIRES: PowerPC G3 processor (original PowerBook G3 and processor-upgrade cards not supported); 128MB RAM; 1.5GB hard drive space

COMPANY: Apple Computer Cupertino, CA 800-692-7753, 408-996-1010 *www.apple.com/macosx*

ZDNet Price It! 34606

For real-time pricing, go to *priceit.zdnet.com* and enter number.

FILEMAKER PRO 5.5

An Accessible, Flexible Database Maker

BOTH UPGRADERS AND NEWBIES WILL LIKE THE new $249 FileMaker Pro 5.5. An easy-to-use database with both PC and Mac versions, FileMaker is great for cross-platform shops, especially those with a variety of programming proficiencies.

Novices will appreciate how FileMaker's built-in templates, wizards, and scripts let you create data-entry screens, search and sort data, and print out reports without knowing how to program. To build a database, you can choose from 16 templates that cover business basics such as inventory, billing, and expense reports, along with ID badges, fax cover sheets, and business cards. FileMaker's design environment lets you create both forms and reports; you don't have to learn separate tools.

Current users and more advanced developers can take advantage of version 5.5's better Open Database Connectivity (ODBC) and SQL support. The program also sports a dozen new script functions, imports Excel-named ranges, and runs on Windows 2000. The Web Companion, FileMaker's publishing engine, supports HTTP 1.1 and is multithreaded for better performance. It includes a Web server that can run on your desktop and a portal page for databases you've shared.

FileMaker uses Cascading Style Sheets (CSS) for its Web output to mimic the look of the desktop application. Unfortunately, some of the graphics, such as the rounded boxes, fill patterns, and buttons, do not translate well to the Web, appearing instead as rectangles or solid colors. We did like the way FileMaker automatically created a menu with options, without requiring any coding. You can share the database applications directly from your desktop, intranet, or extranet.

FileMaker Pro 5.5 offers a lot of power without requiring a programmer. If your business needs cross-platform compatibility between Macs and PCs and you want a user- and IS-friendly database-development environment, FileMaker is the one.

—Jay Munro

EDITORS' RATING 7.4

RATED 1 TO 10

BASIC DATABASE FUNCTIONS	8
EASE OF USE	8
FEATURES	7
PROGRAMMING	6
VALUE	8

Easy for basic tasks; SQL Server and Oracle ODBC drivers provided; PC and Mac interoperability

Can't get to SQL Builder from Script Builder; most dialogs are modal

DIRECT PRICE: $249; $149 (UPGRADE)

REQUIRES: PC: Windows 95, 98, Me, or 2000, or NT 4.0 (with Service Pack 3); Windows 98, NT 4.0, or 2000 required for Web Companion and ODBC features. Mac: Power Mac or later; Mac OS 8.1 to 9.1; Mac OS 8.6 to 9.1 required for Web Companion and ODBC features; G3 processor, 128MB RAM required for use with OS X.

COMPANY: FileMaker Santa Clara, CA 800-325-2747, 408-987-7000 *www.filemaker.com*

ZDNet Price It! 34614

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- 40GB Ultra DMA-100 Hard Drive
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- **16x DVD-ROM Drive**
- 32MB nVidia GeForce-2 MX200 AGP Video
- AC97 Stereo 3D Sound
  upgrade: Yamaha-744 Digital Sound & SPDIF @ $29
- 56K V.90 Fax Modem w/Voice
- 750 Watt PMPO Subwoofer Speaker System
- 17" Digital SVGA Monitor, .27mm
- PS2 Win98 Keyboard & Scrolling Internet Mouse
  upgrade: MS Optical Intelli-Mouse @ $27
- MS Windows ME (Millennium) Edition
- **Free COREL Office 2000 CD**
- One Year On-Site Warranty - add $29

AMD DURON	800	$ 659	(assp091)
AMD DURON	900	$ 679	(assp092)
AMD ATHLON	1.0 GHZ	$ 699	(assp093)
AMD ATHLON	1.1 GHZ	$ 709	(assp094)
AMD ATHLON	1.2 GHZ	$ 715	(assp095)
AMD ATHLON	1.33 GHZ	$ 729	(assp096)
AMD ATHLON	1.4 GHZ	$ 759	(assp097)

$1465 NIGHT DREAMER

- **DDR 266FDB UDMA-100 Main Board**
- Black Hydraulic Mid Tower Case
- 512MB DDR PC2100 SDRAM
- 60 GB Ultra DMA-100 HDD (system)
- **64MB nVidia GeForce-3 nFinite Video**
- **Yamaha 744 Digital Sound Card with SPDIF and Optical Fiber Cable**
- 16x DVD-ROM Drive
- 16x10x40 CD-Rewritable Drive
- IEEE-1394 Fire Wire 3 Ports w/software & cable
- 56K V.90 ZOOM Modem w/Voice
- **Black 19" Digital SVGA Monitor, .26mm**
- Black ALTEC LANSING ACS54 Speakers
- Microsoft Optical Explorer Mouse!
- Black PS2 Win98 Keyboard
- MS Windows ME (Millennium) Edition
- **Free COREL Office 2000 & Norton 2001 CD**
- One Year On-Site Warranty - add $29

AMD ATHLON	1.0 GHZ	$ 1465	(nigsp091)
AMD ATHLON	1.1 GHZ	$ 1475	(nigsp092)
AMD ATHLON	1.2 GHZ	$ 1485	(nigsp093)
AMD ATHLON	1.33 GHZ	$ 1495	(nigsp094)
AMD ATHLON	1.4 GHZ	$ 1525	(nigsp095)
AMD ATHLON	1.5 GHZ	$ 1575	(nigsp096)

$819 BACK TO SCHOOL

Sep 2000 Computer Buyer's Guide **BEST BUY**

(www.ibuypower.com/product-pc/back-to-school.htm)

- **VIA KT-133A UDMA-100 MB**
- 256MB PC133 SDRAM
- 40GB Ultra DMA 100 HDD
- 12x10x32 CD-Rewritable Drive
- **64MB nVidia GeForce-2 MX400 AGP Video**
- AC97 Stereo 3D Sound
  upgrade: Yamaha-744 Sound w/SPDIF @ $29
- 56K V.90 Fax Modem w/Voice
- 19" Digital SVGA Monitor, .26mm
- *PS2 Win98 Keyboard* & Scrolling Internet Mouse
  upgrade: MS Optical Intelli-Mouse @ $27
- 7 Pieces 1000 Watt Surround Sound Speakers
- MS Windows ME (Millennium) Edition
- **Free Corel Office 2000**
- One Year On-Site Warranty - add $29
- 16x DVD-ROM - add $69

AMD ATHLON	1.0 GHZ	$ 819	(btsp091)
AMD ATHLON	1.1 GHZ	$ 829	(btsp092)
AMD ATHLON	1.2 GHZ	$ 839	(btsp093)
AMD ATHLON	1.33 GHZ	$ 849	(btsp094)
AMD ATHLON	1.4 GHZ	$ 879	(btsp095)
AMD ATHLON	1.5 GHZ	$ 929	(btsp096)

$985 MP3 PRO

- **DDR 266FSB UDMA-100 Main Board**
- **256MB DDR PC2100 SDRAM**
- 40GB Ultra DMA-100 HDD
- 12x10x32 CD-Rewritable Drive
- **64MB ATI Radeon DDR Video**
- **Yamaha 744 Digital Sound Card with SPDIF & Optical Fiber Cable**
  upgrade: Sound Blaster Live! X-Gamer 5.1 @ $79
- 56K V.90 Fax Modem w/Voice
- 19" Digital SVGA Monitor, .26mm
  upgrade: **19" REAL FLAT** SVGA .22mm @ $99
- PS2 Win98 Keyboard & Scrolling Internet Mouse
  upgrade: MS Optical Intelli-Mouse @ $27
- 7 Pieces 1000 Watt Surround Sound Speakers
- MS Windows ME (Millennium) Edition
- **Free Corel Office 2000 CD**
- One Year On-Site Warranty - add $29
- 56x CD-ROM - add $30

AMD ATHLON	1.0 GHZ	$ 985	(mpsp091)
AMD ATHLON	1.1 GHZ	$ 995	(mpsp092)
AMD ATHLON	1.2 GHZ	$ 1005	(mpsp093)
AMD ATHLON	1.33 GHZ	$ 1015	(mpsp094)
AMD ATHLON	1.4 GHZ	$ 1045	(mpsp095)
AMD ATHLON	1.5 GHZ	$ 1095	(mpsp096)

$1025 GAMER'S PRO

(www.ibuypower.com/product-pc/gamer-pro.htm)

- **DDR 266FSB UDMA-100 Main Board**
- 256MB DDR PC2100 SDRAM
- **40GB Ultra DMA-100 HDD**
- 12x DVD-ROM
- 12x10x32 CD-Rewritable Drive
- **64MB nVidia GeForce-2 DDR Video**
  upgrade: 64MB GeForce-3 nFinite @ $199
- **Yamaha 744 Digital Sound Card with SPDIF and Optical Fiber Cable**
- 56K V.90 Fax Modem w/Voice
- 19" Digital SVGA Monitor, .26mm
  upgrade: **19" REAL FLAT** SVGA .22mm @ $99
- **ALTEC LANSING AVS500 5 Pieces Speakers**
- Microsoft Intelli Mouse ; PS2 Win98 Keyboard
- MS Windows ME (Millennium) Edition
- **Free Corel Office 2000 CD**
- One Year On-Site Warranty - add $29

AMD ATHLON	1.0 GHZ	$ 1025	(gpsp091)
AMD ATHLON	1.1 GHZ	$ 1035	(gpsp092)
AMD ATHLON	1.2 GHZ	$ 1045	(gpsp093)
AMD ATHLON	1.33 GHZ	$ 1055	(gpsp094)
AMD ATHLON	1.4 GHZ	$ 1085	(gpsp095)
AMD ATHLON	1.5 GHZ	$ 1135	(gpsp096)

$1365 GAMER'S DREAM

Apr 2000 PC Gamer Editors' Choice Award

- **DDR 266FSB UDMA-100 Main Board**
- 256MB DDR PC2100 SDRAM
- **60GB Ultra DMA-100 HDD**
- 16x DVD-ROM Drive
- **16x10x40 CD-Rewritable Drive**
- IEEE 1394 Fire Wire 3 Ports w/ software & cable
- **64MB nVidia GeForce-3 nFinite Video**
- Creative Lab Sound Blaster Live! Value
  upgrade: Sound Blaster Live X-Gamer 5.1 @ $59
- 56K V.90 Fax Modem w/Voice
- 19" ViewSonic E90 .23mm SVGA Monitor
  upgrade: 19" ViewSonic GS790 .22mm @ $80
- **ALTEC LANSING AVS500 5 Pieces Speakers**
- **Microsoft Intelli Mouse** & PS2 Win98 Keyboard
- MS Windows ME (Millennium) Edition
- **Free COREL Office 2000**
- One Year On-Site Warranty - add $29

AMD ATHLON	1.0 GHZ	$ 1365	(gdsp091)
AMD ATHLON	1.1 GHZ	$ 1375	(gdsp092)
AMD ATHLON	1.2 GHZ	$ 1385	(gdsp093)
AMD ATHLON	1.33 GHZ	$ 1395	(gdsp094)
AMD ATHLON	1.4 GHZ	$ 1425	(gdsp095)
AMD ATHLON	1.5 GHZ	$ 1475	(gdsp096)

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IEEE-1394 fire wire 6-port repeater @ $69

IEEE-1394 fire wire cardbus PCMCIA 400 Mbps max. transfer rate @ $89

IEEE-1394 device bay, for HDD, CD-ROM, CD-RW... @ $109

IEEE-1394 fire box, for portable 2.5" slim HDD @ $99

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$1099 POCKET EPC-II

- Intel Celeron 700MHZ (P-III 800/933/1000MHZ available)
- Intel 810E Chipset
- **56K V.90 Modem Built-in**
- **10/100 Network Built-in**
- 64MB SDRAM(max. 256MB)
- 10GB Hard Drive(max. 20GB)
- 4MB AGP Video Integrated
- 3D Sound Integrated
- 24x CD-ROM and Floppy Drive Included
- MS Windows ME CD
- **1-Year Limited Warranty**

$489 HOME PC

- PROCOMP 133Mhz Main Board
- 8MB AGP Video & 3D Stereo Sound
- 256MB PC133 SDRAM
- 30GB UDMA100 HDD
- **17" Digital SVGA .27mm Monitor**
- 56x CD-ROM Drive
- 56K V.90 Fax/Modem
- Network Card built-in
- Win98 Keyboard & Scrolling Internet Mouse
- 120 Watts PMPO Stereo Speakers
- One Year On-Site Warranty - add $29
- MS Windows ME CD - add $89
- 100MB Internal ZIP Drive - add $49

Intel CELERON 800	$ 489	(hosp091)
Intel CELERON 900	$ 509	(hosp092)
Intel Pentium III 866	$ 569	(hosp093)
Intel Pentium III 933	$ 589	(hosp094)
Intel Pentium III 1000	$ 599	(hosp095)

CBG&H BEST BUY

Best Buy Award - Jun 2001, Computer Buyer s Guide & Handbook
"the DDR architecture and speedly Athlon CPU provide an excellent computing backbone."

Best Buy Award - Mar 2001, Computer Buyer s Guide & Handbook
"at the very affordable price, it 's done something that we can't remember a PC ever doing before: it won our Best Buy award three months in a row."

Best Buy Award - Feb 2001, Computer Buyer's Guide & Handbook
"with an extremly powerful processor and video card, it is a aimed primary at gamers and performance enthusiasts."

PC GAMER EDITORS' CHOICE

Best Buy Award - Jan 2001, Computer Buyer's Guide & Handbook
"Blazing video performance, a decked out example of a no-holds-barred performance oriented system."

Best Buy Award - Sep 2000, Computer Buyer's Guide & Handbook
"Incredible, a nice compromise between cost and all-out performance."

Editor's Choice - Apr 2000, PC Gamer magazine
"Super fast, stable, nice price for a high end system."

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$515 WORKSTATION PC

- PROCOMP 133Mhz Main Board
- 256MB PC133 SDRAM
  upgrade: 512MB PC133 SDRAM @ $39
- 30GB Ultra DMA100 Hard Drive
  upgrade: 40GB Ultra DMA100 Hard Drive @ $27
- 56x CD-ROM Drive
  upgrade: 16x DVD @ $35
- 32MB nVidia Riva TNT-2 M64 4x AGP Graphics
  upgrade: 64MB nVidia GeForce-2 MX400 @ $49
- 10/100 D-Link Ethernet PCI Network Card
  upgrade: 10/100 3COM Ethernet Card @ $35
- 17" Digital SVGA .27mm Monitor
- Win98 Keyboard & Scrolling Internet Mouse
- One Year On-Site Warranty - add $29
- MS Windows ME CD & Manual - add $89
- 100MB Internal ZIP Drive - add $49
- 56K V.90 Fax/Modem - add $19
- IEEE-1394 PROCOMP Fire Wire PCI - add $39

Intel CELERON 800	$ 515	(wosp091)
Intel CELERON 900	$ 535	(wosp092)
Intel Pentium III 866	$ 599	(wosp093)
Intel Pentium III 933	$ 619	(wosp094)
Intel Pentium III 1000	$ 629	(wosp095)

$655 POWER BEST BUY

- **VIA KT-133A/INTEL 815E UDMA-100 MB**
- 256MB PC133 SDRAM
- 40GB Ultra DMA-100 Hard Drive
- 12x DVD-ROM Drive
  upgrade: 16x DVD-ROM @ $29
  upgrade: 12x10x32 CD-Rewritable @ $55
- 32MB nVidia Riva TNT-2 4x AGP Graphics
  upgrade: 32MB nVidia GeForce-2 MX200 @ $25
- AC97 Stereo Sound
  upgrade: Sound Blaster Live! Value @ $49
- 56K V.90 Fax/Modem w/Voice
- 17" Digital SVGA .27mm Monitor
- PS2 Win98 Keyboard & Scrolling Internet Mouse
- MS Windows ME (Millennium) Edition
- 120 Watt Stereo Speaker System
  upgrade: Altec Lansing ACS33 Speakers @ $39
- One Year On-Site Warranty - add $29

AMD ATHLON 1.0 GHZ	$ 655	(pbbsp091)
AMD ATHLON 1.1 GHZ	$ 665	(pbbsp092)
AMD ATHLON 1.2 GHZ	$ 675	(pbbsp093)
AMD ATHLON 1.33 GHZ	☑ $ 685	(pbbsp094)
Intel Pentium III 866	$ 725	(pbbsp095)
Intel Pentium III 933	$ 745	(pbbsp096)
Intel Pentium III 1000	$ 755	(pbbsp097)

$688 VALUE PERFORMER

- **VIA KT-133A/INTEL 815E UDMA-100 MB**
- 256MB PC133 SDRAM
- 40GB Ultra DMA-100 Hard Drive
- 12x DVD-ROM
  upgrade: 12x10x32 CDRW Drive @ $55
- 32MB nVidia GeForce-2 MX200 4x AGP Video
  upgrade: 64MB nVidia GeForce-2 MX400 @ $29
- AC97 Stereo Sound
  upgrade: Yamaha-744 Digital w/SPDIF @ $29
- 56K V.90 Fax Modem w/Voice
- 17" Digital SVGA Monitor, .27mm
- 400 Watt PMPO Subwoofer Speaker System
- PS2 Win98 Keyboard & Scrolling Internet Mouse
- MS Windows ME (Millennium) Edition
- **Free COREL Office 2000**
- One Year On-Site Warranty - add $29

AMD ATHLON 1.0 GHZ	$ 688	(vasp091)
AMD ATHLON 1.1 GHZ	$ 698	(vasp092)
AMD ATHLON 1.2 GHZ	$ 708	(vasp093)
AMD ATHLON 1.33 GHZ	☑ $ 718	(vasp094)
Intel Pentium III 866	$ 759	(vasp095)
Intel Pentium III 933	$ 779	(vasp096)
Intel Pentium III 1000	$ 789	(vasp097)

CBG&H BEST BUY

$1009 DREAM 2001

Jan, Feb & Mar 2001 **BEST BUY** Awards

- **VIA KT-133A/INTEL 815E UDMA-100 MB**
- 512MB PC133 SDRAM
- 40GB Ultra DMA-100 Hard Drive
- **12x10x32 CD-Rewritable**
- **16x DVD-ROM Drive**
- 64MB nVidia GeForce-2 MX400 4x AGP Video
- Creative Lab Sound Blaster Live! Value
  upgrade: Sound Blaster Live MP3+ 5.1 @ $59
- IEEE-1394 Fire Wire 3 Ports w/ software & cable
- 56K V.90 Fax Modem w/Voice
- 19" Digital SVGA Monitor, .26mm
- PS2 Win98 Keyboard & Scrolling Internet Mouse
- 5 Pieces Surround Sound Speaker System
- MS Windows ME (Millennium) Edition
- **Free COREL Office 2000**
- One Year On-Site Warranty - add $29

AMD ATHLON 1.0 GHZ	$ 1009	(drsp091)
AMD ATHLON 1.1 GHZ	$ 1019	(drsp092)
AMD ATHLON 1.2 GHZ	$ 1029	(drsp093)
AMD ATHLON 1.33 GHZ	☑ $ 1039	(drsp094)
AMD ATHLON 1.4 GHZ	☑ $ 1169	(drsp095)
Intel Pentium III 866	$ 1075	(drsp096)
Intel Pentium III 1000	$ 1105	(drsp097)

$956 DVD - DDR

AOpen

- **DDR UDMA-100 4x AGP MB**
- **256MB DDR PC2100 SDRAM**
- 40GB Ultra DMA-100 HDD
- 16 DVD-ROM
- 12x10x32 CD-Rewntable Drive
- 32MB ATI RADEON VE DDR Dual Monitor Out
  upgrade: 64MB ATI Radeon DDR w/VIVO @ $85
- **YAMAHA-744 Digital Sound Card w/ SPDIF and Optical Fiber Cable**
- 56K V.90 Fax Modem w/Voice
- *19" Digital SVGA Monitor, .26mm*
  upgrade: 19" VIEWSONIC E90 .23 @ $99
- PS2 Win98 Keyboard & Scrolling Internet Mouse
- **ALTEC LANSING AVS500 5 pcs Speakers**
- *MS Windows ME (Millennium) Edition*
- **Free Corel Office 2000 CD**
- One Year On-Site Warranty - add $29

AMD ATHLON 1.0 GHZ	$ 956	(dvdsp091)
AMD ATHLON 1.1 GHZ	$ 966	(dvdsp092)
AMD ATHLON 1.2 GHZ	$ 976	(dvdsp093)
AMD ATHLON 1.33 GHZ	$ 986	(dvdsp094)
AMD ATHLON 1.4 GHZ	☑ $ 1016	(dvdsp095)
Intel Pentium III 933	$ 1025	(dvdsp096)
Intel Pentium III 1000	$ 1045	(dvdsp097)

$805 POWER SPECIAL

(www.ibuypower.com/product-pc/power-special.htm)

- **INTEL i850 Chip UDMA-100 Pentium-4 MB**
- 256 MB PC800 RDRAM Memory
- 40GB Ultra DMA-100 HDD
  upgrade: 60GB UDMA-100 HDD @ $49
- 12x DVD-ROM Drive
- 32MB nVidia Riva TNT-2 M64 Video
- 400 Watt PMPO Subwoofer Speaker System
  upgrade: Altec Lansing AVS500 Speakers @ $45
- PS2 Win98 Keyboard & Scrolling Internet Mouse
- 10/100 INTEL Ethernet Network Onboard
- AC-97 Stereo 3D Sound
  upgrade: S.B. Live Value@ $49
- 56K V.90 Modem w/Voice
- MS Windows ME (Millennium) Edition
- One Year On-Site Warranty - add $29
- 17" SVGA .27mm Monitor - add $155
- 19" SVGA .26mm Monitor - add $225

Intel Pentium 4 1.4 GHZ	$ 805	(p49sp091)
Intel Pentium 4 1.5 GHZ	$ 865	(p49sp092)
Intel Pentium 4 1.6 GHZ	$ 915	(p49sp093)
Intel Pentium 4 1.7 GHZ	$ 945	(p49sp094)
Intel Pentium 4 1.8 GHZ	$ 1115	(p49sp095)
Intel Pentium 4 2.0 GHZ	$ 1165	(p49sp096)

$ 939 PENTIUM-4 999

(www.ibuypower.com/product-pc/p4-999.htm)

- **INTEL i850 Chip UDMA-100 Pentium-4 MB**
- 256 MB PC800 RDRAM Memory
- 40GB Ultra DMA-100 HDD
  upgrade: 60GB UDMA-100 HDD @ $49
- 12x DVD-ROM Drive
- 12x10x32 CD-Rewntable
- 32MB ATI Radeon VE DDR Dual Monitor Out
  upgrade: 64MB ATI Radeon DDR @ $85
- 750 Watt PMPO Subwoofer Speaker System
  upgrade: 7 Pieces Surround Speakers @ $25
- PS2 Win98 Keyboard & Scrolling Internet Mouse
- 10/100 INTEL Ethernet Network Onboard
- AC-97 Stereo 3D Sound
  upgrade: S.B. Live Value@ $49
- 56K V.90 Fax Modem w/Voice
- MS Windows ME (Millennium) Edition
- One Year On-Site Warranty - add $29
- 19" SVGA .26mm Monitor - add $225

Intel Pentium 4 1.4 GHZ	$ 939	(p49sp091)
Intel Pentium 4 1.5 GHZ	$ 999	(p49sp092)
Intel Pentium 4 1.6 GHZ	$ 1049	(p49sp093)
Intel Pentium 4 1.7 GHZ	$ 1079	(p49sp094)
Intel Pentium 4 1.8 GHZ	$ 1249	(p49sp095)
Intel Pentium 4 2.0 GHZ	$ 1299	(p49sp096)

$1239 PENTIUM-4 SUPREME

(www.ibuypower.com/product-pc/supreme.htm)

- **INTEL i850 Chip UDMA-100 Pentium-4 MB**
- **256 MB PC800 RDRAM Memory**
- **40GB Ultra DMA-100 HDD**
- 16x DVD-ROM Drive
- *16x10x40 CD-Writable*
- 64MB nVidia GeForce-2 MX400 Video
- AC-97 Stereo 3D Sound
  upgrade: Sound Blaster Live Value@ $49
- 56K V.90 Fax Modem w/Voice
- 10/100 INTEL Ethernet Network Onboard
- 19" ViewSonic E90 SVGA Monitor, .23mm
  upgrade: 19" ViewSonic GS790 .22mm @ $79
- 7 Pieces 1000 Watt Surround Sound Speakers
- PS/2 Mouse & Win98 Keyboard
- MS Windows ME (Millennium) Edition
- **Free COREL Office 2000 CD**
- One Year On-Site Warranty - add $29

Intel Pentium 4 1.4 GHZ	$ 1239	(p4sp091)
Intel Pentium 4 1.5 GHZ	$ 1299	(p4sp092)
Intel Pentium 4 1.6 GHZ	$ 1349	(p4sp093)
Intel Pentium 4 1.7 GHZ	$ 1379	(p4sp094)
Intel Pentium 4 1.8 GHZ	$ 1549	(p4sp095)
Intel Pentium 4 2.0 GHZ	$ 1599	(p4sp096)

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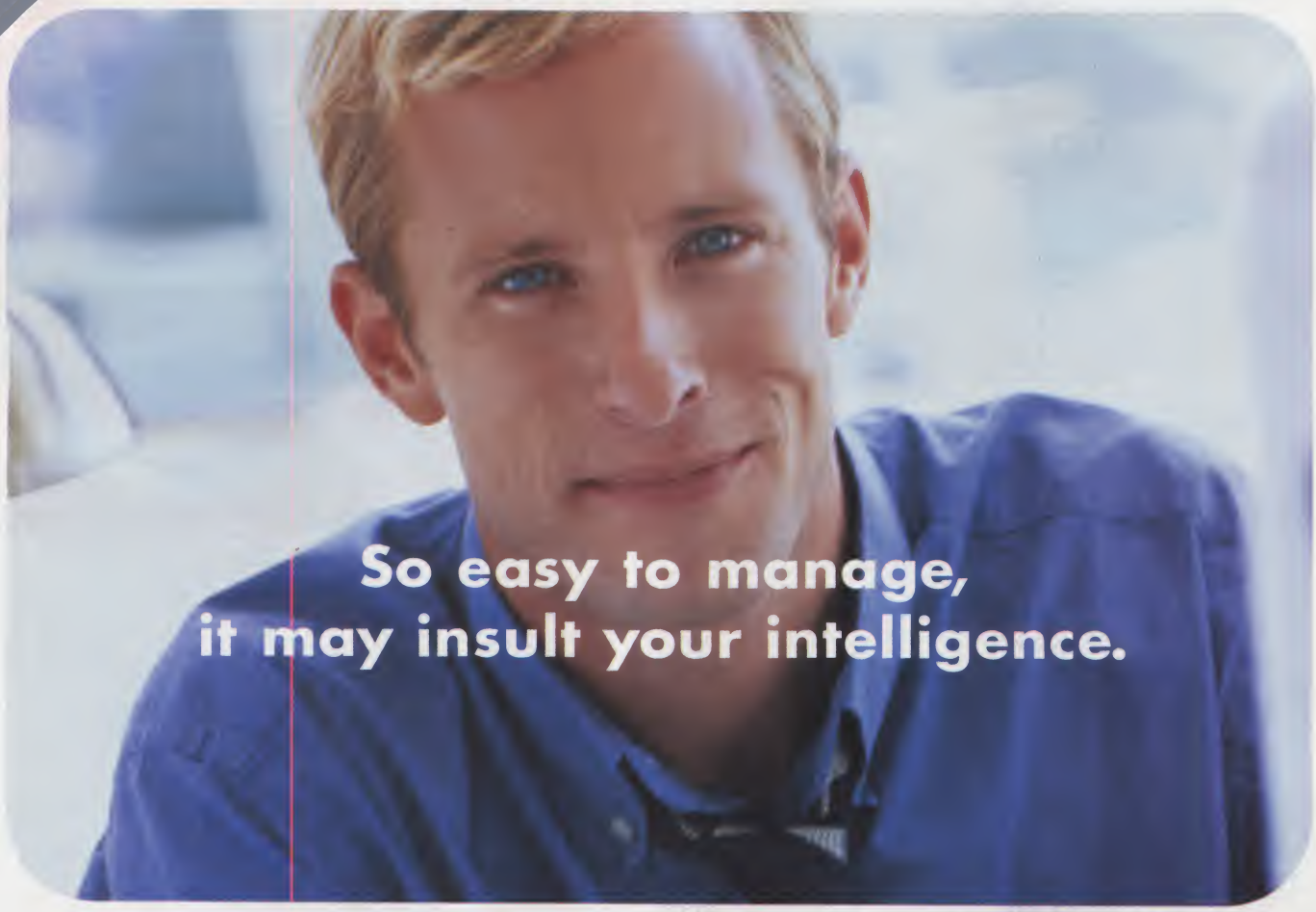

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Corporate e-PC c-10

Model p3376t: Intel® Pentium® III processor 933MHz / Intel 810e chipset / 128MB SDRAM 20GB HDD / 24X max CD-ROM / Intel integrated 3D Direct AGP video / 3Com® 10/100 integrated LAN / Windows® 2000

$999*

VL400

Desktop model p4150t: Intel Pentium III processor 1GHz / Intel i815 chipset / 128MB SDRAM / 20GB HDD / 48X max CD-ROM / Intel Direct 3D integrated video / 3Com 10/100 integrated LAN / Windows 2000

$1149*

Vectra VL400

Desktop model p4151t: Intel Pentium III processor 1GHz / Intel i815 chipset / 128MB SDRAM / 20GB HDD / 48X max CD-ROM / Intel Direct 3D integrated video / 3Com 10/100 integrated LAN / Windows 98

$999*

Vectra VL400

Minitower model p4153t: Intel Pentium III processor 1GHz / Intel i815 chipset / 128MB SDRAM / 20GB HDD / 48X max CD-ROM / Intel Direct 3D integrated video / 3Com 10/100 integrated LAN / Windows 2000

$1169*

Vectra VL800

Minitower model p3640t: Intel Pentium 4 processor 1.4GHz / Intel i850 chipset / 128MB Rambus / 20GB HDD / 48X max CD-ROM / ATI Rage XPERT 128-16MB video / 3Com 10/100 integrated LAN / Windows 2000

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The industry's most reliable, high performance 25 page-per-minute workgroup printer, making this printer an ideal companion for these HP corporate PCs.

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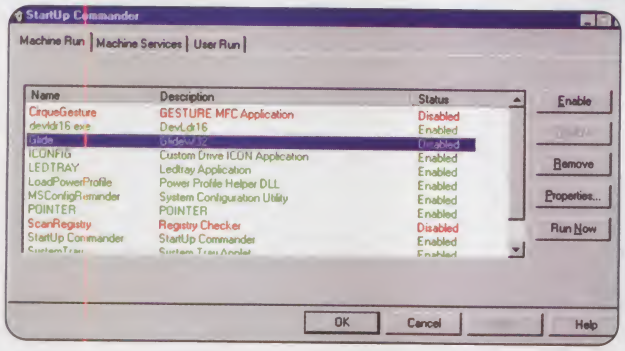
ZDNet BEST BUY

GETTING A NEW COMPUTER IS FUN; MOVING data and programs from your old PC isn't. V Communications' $49.95 ($39.95 for the downloadable version) PC Upgrade Commander makes the move as hassle-free as possible. If you run any version of Windows since Windows 95, this product will migrate applications, data, and settings from your old system to the new one while leaving the new operating system intact.

Migrations are possible over three types of connection: a TCP/IP network, a parallel cable (included), or a network file system (in which two PCs can access a shared network drive). You can also use Jaz, Zip, or Orb removable drives (though not CD-R or CD-RW drives) to move the files.

PC Upgrade Commander runs on both your old and new machines. A checklist walks you through pre-move preparations. An installation wizard then guides you through the process. You can choose to migrate everything, everything but hardware registry keys, or just files.



Although the software reports the amount of data that has been transferred, we'd appreciate an estimate of the total amount before starting, because the time the transfer will take depends on the amount of data on your old machine and the speed of the connection. It took about 2.5 hours to move 800MB from a Windows 98 PC to a Windows Me system over a 10mbps Ethernet connection. The parallel-cable option would likely have taken double that time.

Our new machine booted up with the desktop from the old machine and the StartUp Commander utility. We experienced one error—we'd overwritten a dynamic link library (DLL) file that was under Windows Me PC-health protection—but the OS fixed the problem automatically on reboot.

Windows XP will allow you to do similar tasks in the future, but PC Upgrade Commander does it now and on all versions of Windows after Windows 95. If you are upgrading to a new machine and don't want to start from scratch, it's a must-have. —*Jay Munro*

EDITORS' RATING 8.0

RATED 1 TO 10

EASE OF USE	8
INSTALLATION	8
SUPPORT AND UPDATES	7
VALUE	9

Updates without changing destination OS; wizard-driven; good manual; doesn't overwrite newer apps

No total-size display; can be slow

DIRECT PRICE: $49.95 (BOXED VERSION); $39.95 (DOWNLOAD)

REQUIRES: 16MB RAM; 4MB hard drive space; Windows 95, 98, Me, 2000, or NT

COMPANY: V Communications
San Jose, CA
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ZDNet Price It! 34601

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MACROMEDIA DIRECTOR 8.5 SHOCKWAVE STUDIO

A Great Director, If You Know the Lingo

MACROMEDIA'S $1,199 DIRECTOR 8.5 SHOCKWAVE Studio lets you create scalable 3D content. Using Macromedia's new 3D format, you can export objects from your favorite 3D application, import them into Director, and breathe interactive life into them. If you know Lingo, Director's programming language, you can create practically anything imaginable. If you don't know Lingo, you face a steep learning curve.

The Swiss Army knife of multimedia-development tools, Director supports 2D shapes and animation, streaming audio, bitmap and vector images, video, Flash animations, and interactive programming with its Lingo language. Version 8.5 adds the ability to deliver 3D content and streaming RealAudio and RealVideo. No other package on the market claims greater breadth.

Basic primitive shapes, such as boxes and spheres, are built into Director 8.5's 3D engine. You can drag and drop behaviors such as Create Sphere, or create shapes using Lingo commands. Other canned behaviors permit rotating or dragging the object or dollying the camera. Beyond these basic actions, you're faced with a catalog of more than 340 new 3D Lingo commands.

The most compelling feature is the ability to selectively export only geometry or only animation data. An animator can export only an animation's geometry for user download, then export that animation's movements in separate, smaller files, cutting download time drastically.

Other than the new 3D-development tools in release 8.5, Director now supports streaming RealAudio and RealVideo. Unfortunately, at this writing, Macromedia had no RealServer installed for troubleshooting. Also, a troubling omission is the lack of support for Unix or Linux, limiting Director 8.5's expansion possibilities.

This version of Director Shockwave Studio is a groundbreaking starting point. You should have experienced Lingo programmers on staff to tap its potential, however.

EDITORS' RATING 7.4

RATED 1 TO 10

DESIGN	7
EASE OF USE	6
FEATURES	8
PERFORMANCE	8
VALUE	8

Creates compact, effective animations; supports nearly every media type; most 3D-authoring tools will export to the program

Steep learning curve for new 3D Lingo commands; Lingo dictionary sketchy on examples; no support for Unix or Linux in Multiuser Server

DIRECT PRICE: $1,199; $199 (UPGRADE FROM VERSION 8.0); $399 (UPGRADE FROM VERSIONS 5.0 THROUGH 7.0)

REQUIRES: 64MB RAM; 100MB hard drive space; 3D accelerator recommended. Windows: Pentium II or faster processor; Windows 95, 98, Me, or 2000, or NT 4 (with Service Pack 3). Mac: PowerPC processor (G3 or faster recommended); Mac OS 8.1 or later

COMPANY: Macromedia
San Francisco, CA
800-470-7211, 415-252-2000
www.macromedia.com

ZDNet Price It! 34604

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—*Rick Stevens*

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WEB SERVICES

MUSICMATCH RADIO MX

Juice Up Your Jukebox

WHAT CAN YOU ADD TO ONE OF THE MOST fully featured digital-music player/recorders? A radio. Musicmatch has added a streaming-radio subscription service called Musicmatch Radio MX to its popular Musicmatch Jukebox.

Radio MX extends the features of an already loaded free radio version, and at $4.95 per month, it won't break the bank. In return, you get CD-quality sound, personalization, and deeper customizations.

Radio MX's functions are contained in three interface windows: the Player, with the Play, Stop, and Forward buttons; the Playlist, which shows the songs currently playing; and the Musicmatch Radio main window, where you can select from an assortment of genres, including 80s Hits, Classic Rock, Dance Club, Trip Hop, and New Releases.

You can also pick stations by artist. The Marvin Gaye station yields songs by Marvin Gaye and artists like him. This type of linking is where Radio MX shines—you can hear music you didn't even know you liked. The Now Playing button offers detailed artist information, and an Artist Match option lets you create your own artist groupings for 25 customized playlists.

You can also select era stations, which play music from a modifiable span of time, be it the 1960s or 1999. Further narrow your playlist with the Tempo option, which limits songs to an artist's upbeat or mellow tunes. Finally, you can load your personal stations onto the Radio MX network and access them anywhere.

Radio MX, integrated into Musicmatch Jukebox, has a steep learning curve, however. The three-window interface, with its numerous buttons and menus, creates clutter no custom skin can cover up, and the service strains your bandwidth. Even so, the radio's vast feature set makes it a digital-music must.

—*Steven Abrams*

EDITORS' RATING 6.8

RATED 1 TO 10

EASE OF USE	6
FEATURES	8
PERFORMANCE	7
SERVICE AND SUPPORT	6
VALUE	7

Excellent sound; leverages a powerful media player and extensive music library

Cluttered interface; bandwidth-intensive

DIRECT PRICE: $4.95 PER MONTH, $12.95 FOR THREE MONTHS, $49.95 YEARLY

COMPANY: Musicmatch
San Diego, CA
www.musicmatch.com

ZDNet Price It! 34628

For real-time pricing, go to *priceit.zdnet.com* and enter number.

PHOTODVD

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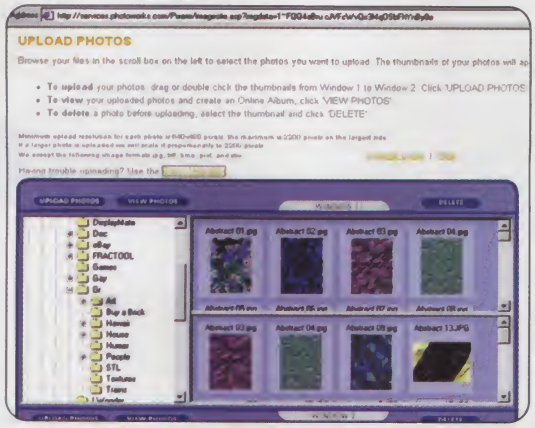
IMAGINE BEING ABLE TO STORE 200 OF YOUR FAVORITE images on one disc and display them as a polished video presentation. That's what PhotoWorks (formerly Seattle FilmWorks) is offering with its PhotoDVD service. Compatible with most late-model computer and TV-attached DVD players, PhotoDVDs have slick features such as prerecorded stereo soundtracks, slow, romantic zooms, and gently dissolving transitions between photos. They're beautifully packaged, and you can create presentations with a variety of standard themes that define backgrounds, borders, color schemes, and transitions for subjects such as travel, romance, and Christmas. The price is right, too: $24.95 for a DVD of up to 50 photos. After that, the cost is 10 cents for each additional photo.

The first step in creating a PhotoDVD is to place your images in an online album, either by mailing PhotoWorks a roll of film or uploading the images directly to its server. A series of online dialog boxes guide you through selecting a soundtrack and theme; choosing, sequencing, and rotating photos in your album; and entering titles, inscriptions, and credits. Completed PhotoDVDs normally take seven to 10 days to arrive by mail, but you can pay for faster service.



It took us a few attempts to upload our images successfully, but the rest of the DVD-creation process was straightforward. It's easy to create an animated 35-photo wedding album, for instance, complete with dreamy dissolves, leisurely zooms, stately title pages, a tinkling soundtrack of Pachelbel's *Canon*, and a white-rose motif. PhotoWorks also inscribes the box with wedding details, such as honeymoon weather and an appropriately themed image.

We would have enjoyed a few more options, such as the ability to use our own photo on the box cover, and greater control over image cropping. Nonetheless, PhotoDVDs are an inexpensive alternative to printed photo albums, and they allow mainstream consumers the same flexibility business presenters have enjoyed for years.

—*Don Labriola*

EDITORS' RATING 7.2

RATED 1 TO 10

EASE OF USE	6
FEATURES	7
PERFORMANCE	6
SERVICE AND SUPPORT	8
VALUE	9

Inexpensive; easy-to-use interface; professional-looking output; money-back guarantee

Limited number of themes and soundtracks; discs do not work in some older DVD players; Web-site users must opt out to protect confidentiality

PRICE: $24.95 FOR AN ALBUM OF 10 TO 50 PHOTOS; 10 CENTS PER ADDITIONAL PHOTO, UP TO 200 MAXIMUM

COMPANY: PhotoWorks
Seattle, WA; 800-746-8696
www.photoworks.com

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GAMESPOT

EMPEROR: BATTLE FOR DUNE

A Line in The Sand

EDITORS' RATING 8.3

ZDNet BEST BUY

Emperor: Battle for Dune is the latest addition to Westwood Studios' family of real-time strategy (RTS) games, and the spiritual successor to

Dune II, the early '90s game that single-handedly defined the genre. Like Dune II, Emperor is based upon the science-fiction universe created by Frank Herbert in the *Dune* novels and depicted in the 1984 movie by David Lynch.

Emperor lets you assume command over the military forces of one of three warring factions fighting to gain ownership of the desert planet Arrakis and its invaluable resources. Aside from a few universal units such as Harvesters and Scouts, each of the three playable factions has completely different military forces. The units of the honorable House Atreides are direct and imposing, and most effective at long-range attacks. The wicked House Harkonnen's units are extremely lethal, but require strong battle tactics as they can be readily countered by troops they're not specifically targeted to destroy. The forces of the mercenary House Ordos are physically weaker, but very versatile. They're fast and equipped with regenerating energy shields that protect them from initial damage.

The game emphasizes fast, intense skirmishes over complicated tactical decision-making, and uses an impressive 3D-graphics engine that really brings the story to life. It also has lots of replay value with three single-player campaigns, a skirmish mode, and robust multiplayer features.

Although Emperor doesn't revolutionize the RTS genre, that may actually make it even more appealing to anyone who's ever liked another game of its type. We highly recommend it.

—*Greg Kasavin*

(Westwood Studios; $49.95 34635 ***www.westwood.ea.com)***

STAR TREK: VOYAGER ELITE FORCE EXPANSION PACK

More Space, Less Filling

EDITORS' RATING 6.6

Last year's Star Trek: Voyager Elite Force was a surprise success. Who would have guessed that a *Star Trek* title would be one of the best first-person shooters of 2000? A major criticism of the game was that it ended too quickly, however, so the decision by Activision and developer Raven Software to create an expansion pack seems like a good call. Ideally, it would give fans of Elite Force more of the same tightly scripted, highly varied single-player scenarios they enjoyed in the original, while expanding the game's fairly basic multiplayer mode.

In reality, the Elite Force Expansion Pack fulfills only half its mission, introducing several new multiplayer options. The single-player features are where it falls short; they are the antithesis of the original single-player levels. The open-ended Virtual Voyager option, for example, simply lets you go on a scavenger hunt within a 3D re-creation of the TV show's starship. Some aspects of Virtual Voyager may be enjoyable to fans of the TV series, but it's not likely to be much fun or of much use to those who enjoyed Elite Force for any reason beyond its source material.

Nevertheless, the new multiplayer options are mostly worthwhile, even though they're not groundbreaking or outside of the realm of free downloadable mods. Overall, the Elite Force Expansion Pack is best suited for those who couldn't get enough of the original's multiplayer holomatch. These players in particular will find the pack's $20 price reasonably justified by some of the new features.

(Activision; $19.99 34627 ***www.activision.com)*** —*G.K.*

HALF-LIFE: BLUE SHIFT

Singing the FPS Blues

EDITORS' RATING 7.0

Half-Life: Blue Shift is the second official retail expansion to Valve Software's groundbreaking 1998 first-person shooter. Blue Shift was developed by Gearbox Software, the same team that brought us the excellent 1999 Half-Life expansion Opposing Force, in which you play as one of the commandos sent in to eliminate Gordon Freeman, the protagonist of the original game. Blue Shift actually comes bundled with Opposing Force, and you don't need the original Half-Life to play either one. For good measure, Blue Shift also packages the Half-Life High Definition pack, which refurbishes some of the graphics throughout Half-Life and makes the entire game look a little better.

Blue Shift puts you in the role of one of Half-Life's stalwart, levelheaded security personnel. Barney Calhoun, your character in Blue Shift, supposedly doesn't have the same academic background as Gordon Freeman, nor does he have the military training of Corporal Adrian Shephard, the protagonist of Opposing Force, although none of this really comes across in the context of playing the game.

Blue Shift is a great value if you haven't tried Opposing Force, an expansion pack that originally sold for $10 more than Blue Shift's $29.95 price. If you've already played Opposing Force, however, and spent plenty of time with the original game, you'll find Blue Shift doesn't have much new to offer. It's way too short and lacks any multiplayer innovations of its own. Owners of Opposing Force can get a $10 rebate for Blue Shift, but that still doesn't make this underachieving expansion pack worth the price. —*G.K.*

(Sierra Studios, $29.95 34630 ***www.sierrastudios.com)***

TRAIN SIMULATOR

Next Stop: Your House

EDITORS' RATING 8.2

Railroads are romantic. They call to mind bygone eras when steam locomotives ferried silver and gold down from the mountains in the Old West or passenger trains carried GIs back to their sweethearts after World War II. Even today, the massive power of locomotives can evoke the same type of awe as planes and race cars. But while there are plenty of racing and flight sims, the only train games available so far have focused on strategic empire building. In Train Simulator, however, Microsoft has created a realistic simulation of the iron horse—one that holds its own next to its racing and flying peers.

Train Simulator puts you in control of six different railway routes, covering more than 600 miles of track. Each cab view features animated controls and readouts similar to what you'd find on real-life engines.

When you're ready to get into the meat of the sim, you can tackle activities that model everyday railroad operations: sticking to a tight schedule as you load and unload passengers at multiple stations, managing a freight train through bad weather, and conducting complex switching operations in freight yards. In the switching operations, you need to get the right cars from different rail sidings coupled to your train in the right order—no mean feat in a large yard with lots of mixed cars.

Train Simulator clearly lacks some of the thrills of its racing- and flight-themed brethren. But this meticulously crafted and often beautiful virtual railway has what it takes to satisfy both hard-core players and those who merely want to enjoy the ride. —*Scott Osborne*

(Microsoft; $54.95 34626 ***www.microsoft.com/games/trainsim)***

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1.7GHz PENTIUM 4 SYSTEMS

BUILT FOR

These five PCs use Intel's latest Pentium 4 processor to put the pedal to the metal for both games and business applications.

PHOTO-ILLUSTRATION BY BILL MILNE/STOCK PHOTO, TONY STONE

Even if your PC is still relatively fast, the ever-soaring clock speeds of AMD Athlon and Intel Pentium 4 chips can bring on a bad case of processor envy. Every few months, it seems, the arrival of a new CPU ratchets up the PC performance bar a couple of notches. Intel's 1.7GHz Pentium 4 is the most recent, and fastest, processor to hit the street.

Of course, it goes without saying that most everyday computing chores don't require 1.7GHz of computing power. On the other hand, if you perform CPU-intensive tasks on your PC—such as image and video editing, gaming, or 3D rendering—you're likely to find the performance boost offered by the latest member of the Pentium 4 family to be very worthwhile.

The five computers reviewed here range from a stripped-down business machine to a blazing game rig complete with its own custom paint job. At their core, however, all of these systems are similar, sharing the same processor, motherboard chipset, and PC800 RDRAM memory. But what a difference a configuration can make. Install Windows 2000 on a Pentium 4, and it rips through productivity-software benchmarks, helped in large part by that OS's fast hard drive access. Drop in a GeForce3 card, and you have a powerhouse gaming machine. Slide in a DVD-R drive and an IEEE 1394 (FireWire) interface card, and you have a home DVD studio that can process video in real time.

It's these configuration choices that should be your primary concern when shopping for a Pentium 4 system. Are you simply looking for a fast machine that will burn through business apps with minimal waiting? Do you want the hottest gaming rig on the block? Or are you looking for a workstation that will let you produce Web and DVD video in record time?

Regardless of your specific needs, expect to pay a premium for the privilege of owning a system based on today's fastest CPU. Despite Intel's recent price drops, most of these systems fall on either side of $3,000, but they tend to be packed with high-end components, such as 7,200rpm hard drives, the latest graphics cards, and plenty of pricey RDRAM memory. If you're willing to pay for top speed, buying one of these power-packed PCs should fend off the upgrade bug for a while.

BY DENNY ATKIN AND LORI GRUNIN

SPEED

1.7GHz PENTIUM 4 SYSTEMS

< FACT FILE >	
Category Tested	1.7GHz Pentium 4 Desktop Systems
Price Range	$2,199 to $3,499
Minimum Configuration	256MB RDRAM; 60GB hard drive; 19-inch monitor; 12x/8x/32x CD-RW drive; 32MB graphics card; 10/100mbps Ethernet adapter; Windows 2000 or Windows Me
Companies Included	ABS Computer Technologies, Alienware, Compaq Computer, IBM, MicronPC
BEST BUY	Alienware Area 51

ABS PERFORMANCE MEGA

EDITORS' RATING **7.7**

DESIGN	8	PERFORMANCE	9
EASE OF USE	6	SERVICE AND SUPPORT	7
FEATURES	8	VALUE	8

PROS: Terrific price; excellent application performance; great gaming potential
CONS: Slim software bundle; odd choice of OS for gaming system

From its attractive black surround-sound speakers to its stark innards, the ABS Performance Mega initially looks like a decked-out gaming machine, and, for the most part, it lives up to that impression. But while experienced gamers who know their way around a system will find this $2,199-direct system to be a fantastic deal, a few setup hitches prevent us from recommending it to PC neophytes.

The Performance Mega came configured with Windows 2000 installed, and though it achieved excellent application performance scores overall, it didn't quite live up to the 3D potential of its GeForce2 Ultra-based graphics card. If you're looking for a top-flight gaming system, you could probably boost its 3D-graphics performance by opting for Windows Me, but you'll sacrifice some application speed because of decreased hard drive throughput.

On the other hand, if you're looking for a general-purpose PC, we'd opt for a different sound setup than the one that came with our evaluation system. The Cambridge SoundWorks PlayWorks DTT2500 Digital speakers, combined with the Creative Labs Sound Blaster Live X-Gamer 5.1 sound card, produces great gaming sounds and good movie surround, but we were less impressed with its audio quality for music. If you're not a gamer or DVD-film buff, you may want to save yourself some money—and considerable setup effort—by choosing another sound package.

In addition to the time required to set up the speakers, the system needed some post-unpacking tweaks before we were ready to run. For instance, we had to remove the cutouts covering the USB ports and update the display settings for an 85Hz refresh rate, rather than the eye-jarring

< FEATURE COMPARISON >

	ABS Performance Mega	Alienware Area 51 (BEST BUY)
DIRECT PRICE	$2,199	$3,499
CONFIGURATION		
Processor	1.7GHz Intel Pentium 4	1.7GHz Intel Pentium 4
RDRAM Installed/Maximum	256MB/2GB	256MB/1GB
System Memory Type	PC800	PC800
Motherboard	Micro-Star MS-6339	Asus P4T
Chipset	Intel 850	Intel 850
Ultra ATA/100 Hard Drive	60GB Maxtor DiamondMax Plus 60	60GB IBM Deskstar 60GXP
Hard Drive Spin Rate	7,200rpm	7,200rpm
Graphics Card	Leadtek WinFast GeForce2 Ultra	VisionTek GeForce3
Graphics Chipset	nVidia GeForce2 Ultra	nVidia GeForce3
Graphics Memory	64MB DDR SDRAM	64MB DDR SDRAM
19-Inch Monitor	ViewSonic E90	NEC MultiSync FE950+
Maximum Monitor Resolution	1,600x1,200	1,792x1,344
Monitor Dot or Stripe Pitch	0.23mm	0.25mm
CD-ROM Drive	None	None
CD-RW Drive	Plextor PlexWriter 16/10/40A	Plextor PlexWriter 16/10/40A
CD-RW Write/Rewrite/Read Speed	16x/10x/40x	16x/10x/40x
DVD-ROM Drive	AOpen DVD-1640 Pro	Pioneer DVD-116
DVD-ROM Drive Speed	16x	16x
DVD-R/DVD-RW Write Speeds	NA/NA	NA/NA
DVD/MPEG-2 Decoder Software	Leadtek WinFast DVD	CyberLink PowerDVD
Sound Card	Creative Labs Sound Blaster Live X-Gamer 5.1	Creative Labs Sound Blaster Live Platinum 5.1
Speakers	Cambridge SoundWorks PlayWorks DTT2500 Digital	Klipsch ProMedia 4.1
56kbps Modem	Yes	Yes
10/100mbps Network Card	Yes	Yes
Total/Available Front-Accessible 3.5-Inch Bays	One/one	Two/one
Total/Available Front-Accessible 5.25-Inch Bays	Three/one	Four/one
Total/Available Internal 3.5-Inch Bays	Two/one	Six/four
Total/Available Internal 5.25-Inch Bays	None/none	None/none
Total/Available PCI Slots	Five/one	Five/one
Total/Available ISA Slots	None/none	None/none
Ports	Parallel, two serial, game, three IEEE 1394, mouse, two USB, VGA, DVI-D	Parallel, two serial, game, IR, three IEEE 1394, mouse, two USB, VGA
Installed OS as Tested	Windows 2000	Windows Me
Dimensions (HWD, Inches)	16.8x8x18.3	20.6x8.1x18.6
Weight (Pounds)	38	40
Bundled Software	Easy CD Creator, Presto VideoWorks 4.0	Deus Ex, Easy CD Creator 4, GameSpy Arcade, Mixman Studio, Unreal Tournament, Thief 2, Pinnacle Studio DV Editing Suite, WinZip
SERVICE AND SUPPORT		
Standard Warranty (Parts/Labor)	Three years/lifetime	One year/one year
Extended/Upgraded Warranties Available	Yes	Yes
24-Hour Parts Replacement	No	Yes
Toll-Free Tech Support	Yes	Yes
Technical-Support Hours (ET)	11:30 a.m. to 8:30 p.m., M-F	24 hours daily
Online Technical Support	Yes	Yes
Onsite Service	No (optional)	Yes
Onsite Service Term	One year ($29)	One year
Who Pays for Shipping Under Warranty	Customer one way	Alienware

NA = Not applicable

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ZDNet

60Hz default. On the other hand, we liked the sparsely populated desktop, Start menu, and system tray, despite the fact that such organization stems from the lightweight software bundle, which lacks an office suite.

Still, the Performance Mega comes with all the essential hardware, including a 16x DVD-ROM drive (the ultracool slot-loading kind), a fast Plextor PlexWriter 16/10/40A CD-RW drive, a solid 19-inch ViewSonic monitor, and three IEEE 1394 ports on an add-in card. We were pleasantly surprised to find most of the loose cables taped down inside the spacious system, although we'd recommend that you remove all the tape during setup to prevent the glue from melting later on. The lone empty PCI slot next to the AGP graphics card is a close—though not too tight—fit for whatever add-in card you choose.

The key to the ABS Performance Mega is in the configuration: Either configure it for general use with Windows 2000, or go for gaming with Windows Me. Either way, the hardware provides a solid foundation that experienced users will appreciate.

Compaq Presario 7000T-1.7	IBM NetVista A60 683371U	MicronPC Millennia Max XS
$3,089	$2,210	$2,772
1.7GHz Intel Pentium 4	1.7GHz Intel Pentium 4	1.7GHz Intel Pentium 4
256MB/512MB	256MB/2GB	256MB/1GB
PC800	PC800	PC800
Intel D850GB	Asus P4T	Intel D850GB
Intel 850	Intel 850	Intel 850
75GB IBM Deskstar 75GXP	60GB IBM Deskstar 75GXP	60GB IBM Deskstar 75GXP
7,200rpm	7,200rpm	7,200rpm
Creative Labs 3D Blaster Annihilator 3	VisionTek TNT2 M64	VisionTek GeForce2 GTS
nVidia GeForce3	nVidia TNT2 M64	nVidia GeForce2 GTS
64MB DDR SDRAM	32MB SDRAM	64MB DDR SDRAM
Compaq CV935	IBM G96	MicronPC 900Mx
1,600x1,200	1,600x1,200	1,600x1,200
0.24mm	0.25mm	0.25mm
48x (various makers)	None	None
None (combo drive)	LG CED-8120B	NEC NR-7700A
8x/4x/24x	12x/8x/32x	12x/10x/32x
Pioneer DVR-A03	None	NEC DV-5800A
4x	NA	16x
2x/1x	NA/NA	NA/NA
Mediamatic DVDExpress	None	InterVideo WinDVD
Creative Labs Sound Blaster Live Value	Integrated SoundMax	Creative Labs Sound Blaster Live Value
Klipsch ProMedia 4.1	None	Altec Lansing ACS56 Digital Gamer Speakers
Yes	None	Yes
Yes	Yes	Yes
Two/none	One/none	One/one
Three/one	Two/one	Three/one
Two/one	One/none	Three/three
None/none	None/none	None/none
Five/none	Three/one	Five/two
None/none	None/none	None/none
Parallel, serial, three IEEE 1394, mouse, four USB, VGA	Parallel, serial, game, mouse, four USB, VGA	Parallel, serial, game, mouse, four USB, VGA
Windows Me	Windows 2000	Windows Me
19x8.4x20.9	15x7.6x15	18.5x7x18.5
31	23	40
Microsoft Word, Microsoft Works, Pinnacle Studio DV, Sonic DVDit LE	Lotus SmartSuite Millennium Edition, Microsoft Office 2000 Small Business, Lotus Notes (client license)	Microsoft Office 2000 Small Business, Easy CD Creator 4
One year/one year	Three years/three years	Three years/one year
Yes	Yes	Yes
Yes	No	Yes
Yes	Yes	Yes
24 hours daily	24 hours daily	24 hours daily
Yes	Yes	Yes
Yes	Yes	Yes
One year	One year	One year
Compaq	Customer	Customer

ALIENWARE AREA 51

EDITORS' RATING **8.3**

DESIGN	9	PERFORMANCE	9
EASE OF USE	8	SERVICE AND SUPPORT	8
FEATURES	8	VALUE	8

PROS: Fine-tuned for gaming; sharp-looking custom paintwork; top-quality components; excellent upgrade policy
CONS: Expensive; huge case; standard warranty for only one year

ZDNet BEST BUY

Hard-core gamers have always ranked among the most demanding computer users. For them, a three-month-old graphics card is an antiquated slug, and the latest card is easily worth the $400 to pull in an extra 15 frames per second (up from 100fps) out of Quake III Arena. It's these performance-fixated gamers that Alienware is trying to abduct with its $3,499-direct Area 51.

The first clue that this isn't your typical assembly-line PC comes when you open the box. A three-ring notebook holds the computer's manual, which comes complete with a personalized title page, a breakdown of your system's components, and all the details gamers and hardware aficionados appreciate—benchmarking software, a list of IRQ assignments, and a breakdown of what's in each PCI slot. You'll also find full manuals and driver discs for every component in your system.

In addition to the 1.7GHz Pentium 4 processor, our Area 51 came packed with 256MB of PC800 RDRAM, a GeForce3-based graphics card, a Creative Labs Sound Blaster Live Platinum 5.1 sound card, an Intel Pro/100 S Ethernet card, a U.S. Robotics 56kbps voice/data modem, a Pioneer 16x DVD-ROM drive, and a Plextor PlexWriter 16/10/40A CD-RW drive with BURN-Proof technology—no generic OEM equipment here. The system also has an IEEE 1394 card for video

Alienware Area 51

1.7GHz PENTIUM 4 SYSTEMS

editing and a Creative Labs Live Drive, which adds front-mounted audio-in and -out ports and wireless remote control. Despite all this hardware, you'll still find an open PCI slot, five available 3.5-inch drive bays, and an empty 5.25-inch bay. The bundled monitor, a flat-screen NEC MultiSync FE950+, provides a sharp, vibrant picture, and the superb Klipsch ProMedia 4.1 speaker system will make your floor shake without a hint of sound distortion.

All this customizing pays off: The Area 51 is the fastest Windows Me system we've seen yet. The GeForce3 card delivers great 3D performance, and the combination of a fast CPU and zippy 7,200rpm IBM hard drive, from which only MicronPC seems to be able to eke out slightly more throughput, makes it unbeatable for all types of applications, even video encoding. The Area 51 was a top performer in our gaming and productivity tests, as well.

The full tower case is by far the largest we've ever seen in a consumer system, though a look inside would make any engineer proud. All the cables are tucked away and routed around the edges to maximize airflow from the system's six cooling fans. The PC can also be custom-painted in your choice of colors. Our test system was Conspiracy Blue, a sleek, metallic mica color that extended to the keyboard and matching Microsoft IntelliMouse Explorer.

The hard drive comes loaded with the latest 3D benchmarking software and a number of games and demos, so you can see the system at its best right out of the box. Alienware doesn't include a bundled office suite, though it offers Microsoft Office as an option. The company will even install three games (any game available on the retail market), upgrade them with the latest patches, and test them before shipping your system.

The warranty covers parts and labor onsite for one year, and includes toll-free 24/7 technical support. Two- and three-year extensions are available, and Alienware even helps you stay on the cutting edge: The company offers an unprecedented upgrade policy that lets you upgrade components of your system at wholesale cost. Alienware will even install and configure the new parts and retest the system's performance at no charge; you only have to pay the cost of the components and shipping.

Still, the personalized service, custom configuration, and brand-name components don't come cheaply. The Alienware Area 51 costs hundreds of dollars more than similarly configured systems from other manufacturers. But that's our only real complaint. If you want a system that's tuned for top performance, has the latest drivers, and offers an upgrade path that can keep it at the front of the pack, you'll find the extra money well spent.

COMPAQ PRESARIO 7000T-1.7

EDITORS' RATING 7.7

DESIGN	8	PERFORMANCE	8
EASE OF USE	8	SERVICE AND SUPPORT	7
FEATURES	8	VALUE	7

PROS: Can burn just about any kind of digital media; superb gaming performance; bundled editing software is easy to use
CONS: Expensive; standard warranty coverage for only one year; no utility for backing up data to DVD-R; must go through Internet setup even with own ISP

Most of the Pentium 4 systems we've tested turned in very similar performance, with the choice of operating system sometimes making the biggest difference. So how does a manufacturer make a PC stand out from the pack?

CHANGES IN THE CHIPS

If you tweak and upgrade your system over time, be aware that Intel has some changes in store for the Pentium 4 line. An upcoming motherboard chipset, the Intel 845 (code-named Brookdale), will finally free the Pentium 4 from expensive Rambus DRAM (RDRAM). This will result in lower prices for entry-level Pentium 4 systems, though at a slight hit in performance.

The first revision of the 845 chipset, due this quarter, will only support standard-speed SDRAM memory. An updated revision that will support faster DDR memory is slated for early 2002. Intel estimates that SDRAM will incur about a 10 percent performance penalty compared to RDRAM at processor speeds under 2GHz, with the difference becoming more dramatic as faster Pentium 4s become available.

ILLUSTRATION BY DENNIS HARMS

Later this year, Intel plans to release an updated Pentium 4 chip, code-named Northwood. While today's Pentium 4 processors are built on a 0.18-micron process, the Northwood chips will use Intel's smaller 0.13-micron technology. The processor will feature faster clock speeds and, reportedly, other performance enhancements.

You won't be able to drop a Northwood Pentium 4 into one of today's systems, however. The new CPU will require a Socket 478 motherboard and won't work in the Socket 423 used by current Pentium 4 chips.

< COMPUTER SHOPPER BENCHMARKS >

	ABS Performance Mega	Alienware Area 51 (BEST BUY)	Compaq Presario 7000T-1.7	IBM NetVista A60 683371U	MicronPC Millennia Max XS
PROCESSOR	1.7GHz Pentium 4	1.7GHz Pentium 4	1.7GHz Pentium 4	1.7GHz Pentium 4	1.7GHz Pentium 4
SYSTEM MEMORY	256MB RDRAM	256MB RDRAM	256MB RDRAM	256MB RDRAM	256MB RDRAM
APPLICATION PERFORMANCE					
BAPCo SYSmark 2001	173	149	137	164	145
Internet Content Creation	191	163	154	187	157
Office Productivity	156	136	122	143	133
3D-GRAPHICS PERFORMANCE					
MadOnion.com 3DMark2001 Pro (16-Bit Color)	3,773	5,933	5,873	1,557	3,657
MadOnion.com 3DMark2001 Pro (32-Bit Color)	3,403	5,806	5,745	943	2,879
Quake III Arena (Frames per Second)	122.7	142.2	141.2	12.9	29.1
MPEG-2 Encoding Performance (Frames per Second)	39.8	42.9	42.3	39.5	42.3

For information on how we test desktops, go to ***www.zdnet.com/computershopper/howwetest.*** HIGHER SCORES ARE BETTER

1.7GHz PENTIUM 4 SYSTEMS

Compaq's Presario 7000T-1.7 aims to grab the attention of budding filmmakers by offering the system with a set of out-of-the-box home DVD-production features, in addition to all of the usual high-end goodies.

It's the inclusion of Pioneer's new DVR-A03 DVD-R/RW drive that distinguishes the $3,089-direct Presario 7000T-1.7 from the crowd. The Pioneer drive, which will cost you about $1,000 if purchased separately, will write to DVD-R and DVD-RW discs as well as CD-R and CD-RW media. That means that you can create home movies or amateur films and share them with anyone who owns a DVD player (or a CD-ROM drive, for that matter).

In addition to the DVD-R/RW drive, Compaq equips the system with three IEEE 1394 ports—two in the rear and one

Compaq Presario 7000T-1.7

conveniently placed in front, next to the floppy drive. Alas, this is purely a digital solution, as the system has no composite or S-Video inputs for digitizing analog video.

Compaq's DVD software targets consumers rather than professional video editors. With Pinnacle Systems' Studio DV, for instance, grabbing video clips, splicing them together, and adding titles and sound effects are much simpler than with packages such as Adobe Premiere. Sonic Solutions' DVDit LE lets you copy a series of MPEG-2 videos to DVD, and comes complete with a full-blown custom DVD menu interface. Compaq doesn't include software for copying data files to DVD-R, however, so you'll have to use lower-capacity CD-R or CD-RW discs for data backup.

The Presario 7000T-1.7 can do a lot more than just burn DVDs, of course. As one of two systems here equipped with a GeForce3 graphics card, it's no surprise that it had stellar 3D benchmark scores, although its application-test results trailed those of most of the other systems here. Our test unit also came loaded with 256MB of memory, as well as a 75GB 7,200rpm hard drive, Creative Labs Sound Blaster Live Value sound card, 48x CD-ROM drive, 56kbps modem, 10/100mbps Ethernet card, and 10mbps HomeFree Phoneline home network card. Hopefully, all of this equipment will meet your needs, because all five PCI slots are spoken for. Two open drive bays, one 5.25-inch and one 3.5-inch, are your only options for internal expansion, although there are always the four USB ports (two on the front and two on the rear). Compaq's bundled CV935 monitor has an 18-inch tube and a fairly sharp picture, but it didn't quite compare to the flat-screen monitors on similar Pentium 4 systems. The included speakers, Klipsch's ProMedia 4.1, are among the best multimedia speakers available.

Our only real quibble with the system is that it forces you to go through the signup process for Compaq's bundled Internet services before going online, even if you're using your own ISP. Also, the standard warranty provides only one year of coverage, although extended plans are available. Compaq will even install the system in your home for $129, but setup was so easy that even novices can handle it.

The Compaq Presario 7000T-1.7 is a no-compromise system that excels in video, gaming, and old-fashioned productivity applications. It's expensive, to be sure, but if the idea of making your own DVDs appeals to you, you'll get your money's worth.

IBM NETVISTA A60 683371U

EDITORS' RATING 7.0

DESIGN	6	PERFORMANCE	8
EASE OF USE	7	SERVICE AND SUPPORT	8
FEATURES	6	VALUE	7

PROS: Inexpensive; sleek-looking case and keyboard; excellent warranty coverage
CONS: Screwdriver needed to get into the case; not a lot of room for expansion

The IBM NetVista A60 683371U gets a performance boost from Windows 2000, which takes full advantage of the system's 60GB 7,200rpm hard drive. As a result, the $2,210-direct system, which includes an optional 19-inch monitor, posted top-tier scores on application-based benchmarks. However, this isn't the machine to choose if you want to dabble in gaming after business hours. The TNT2

IBM NetVista A60 683371U

M64 graphics card provides good 2D performance for business applications but poor 3D performance. Sound comes from the motherboard's audio support, but you'll have to supply your own speakers, a perplexing lapse given the system's targeted use toward business presentations.

A 10/100 Ethernet card occupies one of the system's three PCI slots, leaving two open for expansion. The system also has two drive bays available: one 3.5-inch and one 5.25-inch. In keeping with the NetVista's business focus, a DVD-ROM drive is omitted in favor of a 12x/8x/32x CD-RW drive.

The system's insides are decidedly nondescript, but the IBM's keyboard, case, and monitor offer a nice visual departure from the boring beige and wacky-color highlights found on competing systems. This PC's jet-black design wouldn't look out of place on Darth Vader's desk, assuming he had one. But the NetVista's case will send you looking for a Phillips screwdriver to get inside. And only the top and sides come off—the NetVista lacks side-panel access. This design may keep some curious employees from poking around inside, but the lack of easy, tool-less, sliding-panel access won't please IT managers doing mass upgrades.

The NetVista does include some notable software innovations. The Software Selections CD lets you install only the bundled applications you plan to use. This CD also includes a function for automating the transfer of data from your old system via network or removable media. Bundled applications include the Lotus Notes client, Lotus SmartSuite Millennium Edition, and Microsoft Office 2000 Small Business. The NetVista's warranty is excellent, covering parts and labor for three years, though only the first year of service is onsite.

(continued on page 108)

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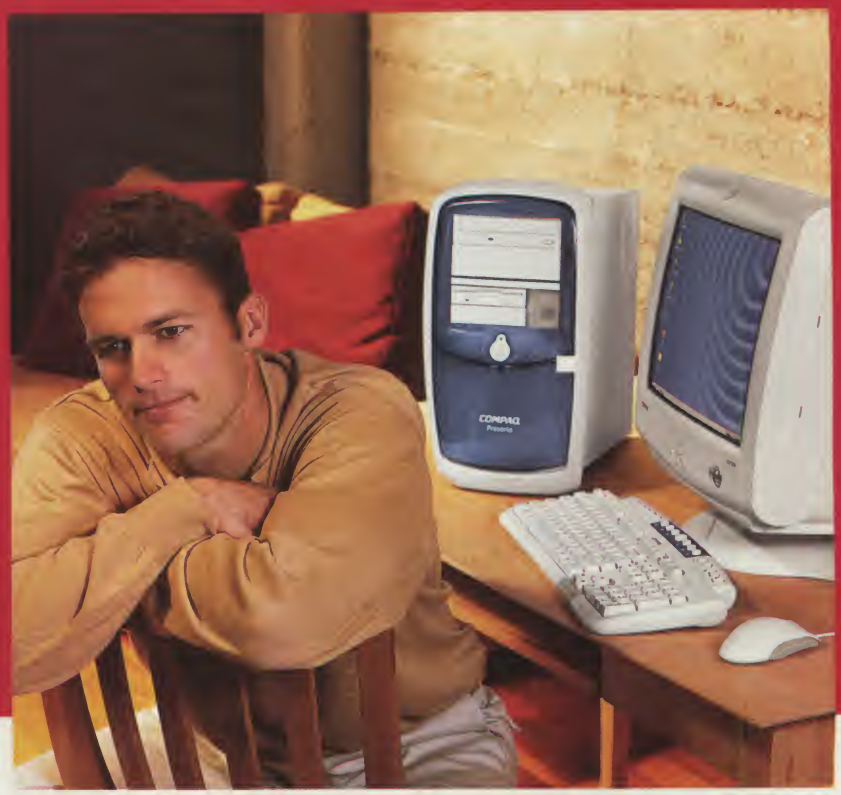

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(continued from page 103)

The IBM NetVista A60 683371U lacks the niceties found on many competing Pentium 4 systems, but its combination of good basic performance, a relatively low price, and excellent support make it a logical choice for business users. After all, a GeForce3 graphics card isn't going to make Excel charts look any better.

MICRONPC MILLENNIA MAX XS

EDITORS' RATING 7.0

DESIGN	7	PERFORMANCE	7
EASE OF USE	7	SERVICE AND SUPPORT	7
FEATURES	7	VALUE	7

PROS: Roomy case design; fluff-free software bundle; superb monitor
CONS: Slow graphics card; misconfigured graphics driver; loud cooling fan; short labor warranty

The $2,772-direct MicronPC Millennia Max XS is an excellent system in almost every respect. Its performance is among the best of the Windows Me-based Pentium 4 PCs we tested, and the components and system design are, for the most part, top-notch.

The XS targets the average performance-hungry user rather than a specific niche, and most of the configuration choices are generous. Our test system packed a 1.7GHz Pentium 4 CPU, 256MB of RDRAM, and a zippy 60GB 7,200rpm hard drive. Application benchmark scores were comparable to those of the other 1.7GHz systems running Windows Me—good, but not as good as those of Windows 2000-based systems. The

1.7GHz PENTIUM 4 SYSTEMS

exception was on our MPEG-2 Encoding Performance test, on which the XS scored a hearty 42.3fps.

The oddity here is the inclusion of a decidedly midrange nVidia GeForce2 GTS graphics card. That alone would usually drop 3D performance down to the merely decent range, but because it arrived with incorrect OpenGL settings, the system scored a surprisingly poor 29.1fps on our Quake III Arena test. Adjusting the driver settings from MicronPC's defaults brought the score to a more respectable but still relatively pokey 74.9fps. If you're a gamer, spend the extra $50 on a GeForce2 Ultra card, and you'll find this a much more agreeable system.

Besides, you'll want a top-notch graphics card to show off the MicronPC 900Mx monitor, which uses a stunning 18-inch-viewable flat-screen Trinitron tube. The system comes equally well-suited for audio. The Creative Labs Sound Blaster Live Value card includes both analog and digital connections to the included Altec Lansing ACS56 Digital Gamer Speakers. These aren't comparable to the Klipsch system included with the Alienware Area 51 and Compaq 7000 series, but they're several cuts above your average bundled speakers.

In addition to the previously mentioned components, our system came equipped with a 16x DVD-ROM, a 12x/10x/32x CD-RW, a 56kbps modem, and a 10/100mbps network card. And you'll still find room for expansion, with four open 3.5-inch drive bays and two empty PCI slots. The case is well-designed, with no loose cables blocking airflow and easy-open, tool-free access. Unfortunately, one of the two cooling fans is quite loud. (When playing flight sims, you can pretend it's a nearby 767.)

The XS also includes a software bundle that's pleasantly lacking in fluff: Microsoft Office 2000 Small Business (Office XP Standard is available for the same price), Easy CD Creator 4, and InterVideo WinDVD. You'll want to disable the useless Creative Launcher (a component of the Sound Blaster software), which eats valuable resources, however.

MicronPC's standard warranty is a bit odd, providing a respectable three years of coverage on parts and one year of free onsite service, though only a year of labor. The company does not provide an onsite-service extension, but you should consider one of its other warranty-extension options if you're not the troubleshooting type.

Aside from its anemic video card, the MicronPC Millennia Max XS is an impressive performer. It illustrates just how important it is to carefully choose every component when buying a system.

FULL SPEED AHEAD

Because of the relative strengths of Windows 2000 and Me, you won't find an all-around performance standout here. The Windows 2000 systems turn in markedly better Office Productivity ratings, while the Windows Me systems take the lead in gaming.

If you're looking for a fast business machine, IBM's NetVista A60 683371U provides loads of power for office apps, Web design, and image editing, all for a very low relative price. But the slightly faster ABS Performance Mega offers a more well-rounded, fully equipped system—and even saves you a few dollars in the process.

If gaming and multimedia are your passion, be prepared for a tougher decision. Our favorite Windows Me system was the Alienware Area 51. Its custom-painted case perfectly accentuates its hot-rod performance scores, and the personal attention Alienware gives to building your system is a rarity. Moreover, the company's unique upgrade policy can keep your system at the head of the performance pack. It's a pricey PC, though, and Compaq's Presario 7000T-1.7 offers similar performance and the latest DVD-writing technology for about $400 less. ▼

< PRODUCT SUMMARY >

EDITORS' RATING (Rated 1 to 10)	7.7	8.3 BEST BUY	7.7	7.0	7.0
SYSTEM	ABS Performance Mega	Alienware Area 51	Compaq Presario 7000T-1.7	IBM NetVista A60 683371U	MicronPC Millennia Max XS
COMPANY	ABS Computer Technologies Whittier, CA 800-876-8088, 562-695-8823 www.abspc.com	Alienware Miami, FL 800-494-3382, 305-259-4262 www.alienware.com	Compaq Computer Houston, TX 800-345-1518, 281-370-0670 www.compaq.com	IBM Armonk, NY 800-772-2227, 914-499-1900 www.pc.ibm.com	MicronPC Nampa, ID 800-214-6669, 208-898-8970 www.micronpc.com
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- V.92 56k Zoom Fax/Modem
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Five new CD-RW drives make rewriting data swift and simple.

The Fast Burn

BY RICK BROIDA

Ben Franklin opined that nothing is certain in life but death and taxes. Little did he know about faster speeds and lower prices, the two certainties in the life of your PC. Take CD-RW drives, for example. The latest rewritable drives read data as quickly as their CD-ROM counterparts, burn CDs in mere minutes, and cost as little as $150. If you're still plugging along with a first- or second-generation drive, now is a great time to upgrade. And if you haven't yet taken the CD-RW plunge, many superb choices await you.

Among the many perks of owning a CD-RW drive are backing up data (a blank CD holds roughly 450 times more than a 3.5-inch floppy), transferring large files between PCs, copying CDs, creating digital photo albums, and of course, making your own digital-music compilations. Plus, because blank media is more affordable than ever—CD-R and CD-RW discs sell for as little as 25 cents and $1 each, respectively—you can put them to use for any number of jobs.

We looked at five internal drives with speeds ranging from 12x/8x/32x to 20x/10x/40x. (The first number is the rated speed for writing to a CD-R, the second for writing to a CD-RW, and the third for reading from a CD.) Higher numbers translate to faster performance—at least in theory. Our testing revealed some anomalies, such as a drive with a 10x CD-RW rating scoring lower than one rated at 8x.

Still, real-world performance varies fairly little among the drives. All can copy a CD in about 6 to 7 minutes (save for the Yamaha CRW2200EZ, which does it in 4 minutes), and require 15 to 20 minutes to format a blank CD-RW disc (except the Sony Spressa CRX160E/A1, which takes just 10 minutes). The crucial exception is in the area of buffer underruns, which can ruin a burn and turn your CD into a coaster. Four of the five drives use technology that protects against underruns. The one that doesn't, the Sony Spressa, has a low $179.99 price in its favor.

Finally, we paid close attention to the amount and quality of each drive's bundled software, which, at the very least, enables you to master and copy CDs, and use CDs like giant floppies for storing and retrieving data. On this front, some users may find that a single, polished program such as Roxio's Easy CD Creator 5 is better to own than a half-dozen disjointed utilities.

< FACT FILE >

Category Tested	Internal IDE CD-RW Drives
Price	Under $250
Requirements	Minimum rating of 12x/8x/32x
Companies Included	Pacific Digital, Plextor America, Sony Electronics, Teac America, Yamaha Corporation of America
BEST BUY	Pacific Digital TurboWriter 121032ei

SONY
YAMAHA
PLEXWRITER
16/10/40A

CD-RW DRIVES

PACIFIC DIGITAL TURBOWRITER 121032EI

EDITORS' RATING 8.3

FEATURES	9	PERFORMANCE	7
INSTALLATION	9	VALUE	8

PROS: Low price; buffer-underrun protection; large software bundle; fast CD-read speed
CONS: Subpar rewritable performance; software is a mixed bag

ZDNet BEST BUY

With the lowest price in the group and one of the largest software bundles, Pacific Digital's $149 TurboWriter 121032ei instantly commands attention. It also has buffer-underrun protection, although you may wind up spending extra money to replace the included CD-RW software, which tended to perform unevenly.

Despite the coarse-looking, photocopied instructions, the 12x/10x/32x drive proved easy enough to install. To its credit, the manual addresses common troubleshooting issues and even provides advice on successful burning. We also found a helpful FAQ page on Pacific Digital's Web site. The company didn't provide documentation for any of the bundled software, however.

Pacific Digital supplies a generous collection of audio, Internet, CD, and system programs—a mix of freeware, oddities, and a few good items (including Musicmatch Jukebox and, for some reason, the firewall utility ZoneAlarm). The main application is NTI CD Maker 2000, which has a dated-looking interface but makes it relatively easy to copy and create CDs, including discs in CD-Extra and mixed-mode formats.

The TurboWriter's use of Sanyo Electric's BURN-Proof (an acronym of sorts for Buffer Under-RuN error-Proof) technology promises an end to buffer underruns that can interrupt a burn and turn CDs into mini-Frisbees. It also lets you multitask on your PC while a burn is in progress; traditionally, you would not perform any other operation while mastering a CD. Some informal testing, including running and uninstalling applications during a CD copy, showed that the technology works as advertised.

Less satisfactory is Pacific Digital's FileCD utility, which lets you add and remove files on CD-RW media. It's supplied in place of the more common DirectCD utility from Roxio. The outdated FileCD applet (its help file was created in 1997) seriously shackled the TurboWriter, resulting in subpar CD-RW reading and writing performance. It's clearly not the hardware's fault: We repeated our tests using Roxio's DirectCD 5.0, and the scores improved dramatically. Still, even with FileCD in place, the drive turned in the fastest CD-R read score in the group.

The verdict on the Pacific Digital TurboWriter 121032ei is clear: If you're willing to live with slightly uneven performance or invest in better software, it's definitely the bargain to beat.

Pacific Digital TurboWriter 121032ei, Plextor PlexWriter 16/10/40A, Sony Spressa CRX160E/A1, Teac CD-W516E, Yamaha CRW2200EZ

PLEXTOR PLEXWRITER 16/10/40A

EDITORS' RATING 8.0

FEATURES	8	PERFORMANCE	9
INSTALLATION	8	VALUE	7

PROS: Buffer-underrun protection; excellent documentation; consistent performance
CONS: Comparatively expensive; bundles last year's version of Easy CD Creator

Over the years, Plextor has earned a well-deserved reputation for making some of the fastest recordable drives around. The $249 PlexWriter 16/10/40A is no exception, although it was edged out by the less expensive Teac and similarly priced Yamaha drives on some of our benchmark tests.

Nevertheless, there's lots to like about the PlexWriter. Its manual is first-rate, with detailed instructions for novices, quick-start shortcuts for experienced users, and a lengthy troubleshooting section. The drive also comes with a thorough manual for Plextor Manager 2000, a small suite of audio and CD applications. The only installation wrinkle is the need to reboot three times, following the installations of Roxio Easy CD Creator 4, DirectCD, and Plextor Manager 2000.

The reboots are worth the trouble, however. This is a versatile software bundle, although the capabilities of Easy CD Creator and Plextor Manager 2000 overlap a bit. What's more, Plextor could have left out the latter package by instead including Easy CD Creator 5 Platinum, which offers more features than the two other programs combined. Still, one utility that music mixers in particular will appreciate is Plextor's AudioFS, which lets your PC recognize audio-CD tracks as WAV files, allowing you to drag and drop tracks to your hard drive with ease.

The Plextor PlexWriter 16/10/40A may not be the fastest drive in the group (it's actually the second fastest overall), but it's certainly one of the most reliable. Updated software would be nice, but otherwise we have no qualms recommending it.

SONY SPRESSA CRX160E/A1

EDITORS' RATING 7.8

FEATURES	7	PERFORMANCE	7
INSTALLATION	9	VALUE	8

PROS: Excellent documentation; inexpensive; comprehensive software bundle; quick to format CD-RW media
CONS: Slightly slower than most competing drives; no buffer-underrun protection

Ostensibly the slowest drive in the group, the Sony Spressa CRX160E/A1 writes at 12x speed, rewrites at 8x, and reads at 32x. But the numbers don't always tell the full story: The Spressa performs competitively and, at $179.99, costs quite a bit less than most "faster" drives.

Sony's excellent quick-start poster should have even novice installers up and running in no time. It includes step-by-step instructions for mounting the drive and using Sony's software, and it prominently displays Sony's toll-free support number and URL for online support. The manual is even better—it explains the various concepts and options of CD burning, and includes an extensive glossary. A photocopied errata sheet provides tips on avoiding buffer underruns.

The Spressa's performance was mixed,

For expanded coverage, go to our Reviews Hub at computershopper.zdnet.com/reviews ZDNet

with above-average write scores but low read scores. Despite its 8x CD-RW rating, it outpaced Pacific Digital's 10x drive hands down in our write tests. The Spressa also has one small but valid point in its favor: While the other drives took at least 15 minutes—sometimes 20—to format a blank CD-RW, it completed the task in under 10 minutes.

Sony's CD Complete Pro software suite includes applications for creating CDs, listening to music, mixing audio, and more. The anchor is CD Extreme, a wizard-driven, though occasionally confusing, tool that lets you copy and compile data and audio CDs. It's a capable program, though not quite as polished as Easy CD Creator. We particularly liked Retrospect Express, which performs scheduled backups, and Mixman Studio, a stylish music-creation program.

With an enticing price and no major strikes against it, apart from its lack of underrun protection, the Sony Spressa CRX160E/A1 merits serious consideration for burner buyers on a budget.

CD-RW DRIVES

Double Duty

No room in your PC or notebook for a DVD-ROM drive *and* a CD-RW drive? No problem—you can now opt to watch movies and burn discs using just a single bay. Acer, Hewlett-Packard, Samsung, and Toshiba are among the vendors already offering combination DVD/CD-RW drives, some of which cost even less than a stand-alone CD-RW.

Samsung's internal SM-308, for instance, offers 8x/4x/32x performance as a CD-RW drive and 8x DVD-ROM speed, all for $199. Alas, the drive lacks buffer-underrun protection, so you'll likely need to create CD images on your hard drive before burning copies. At last November's COMDEX show, Samsung also unveiled a combo drive for notebooks, although there's [illegible] to which notebook makers have [illegible]

If 700MB of storage won't cut [illegible] be ready for the next generation of [illegible] nology: recordable DVD. Last year with [illegible] the arrival of the first DVD-RAM and DVD+RW drives, which now offer up to 9.4GB of rewritable storage per disc (4.7GB on each side). The drives and media remain expensive (around $500 and $25, respectively), but that's likely to change as users outgrow CD-RW's relatively limited capacity and more manufacturers start producing recordable DVD drives in volume.

Watch, too, for combo DVD drives that support multiple standards. New models from LaCie and Panasonic, for example, can burn to both DVD-RAM and DVD-R media, the latter an emerging write-once format that can be played in living-room DVD players. While the standards war between DVD-RAM and DVD+RW has yet to declare a victor, there's little question that the drive you buy in a year or two is likely to have a DVD label.

—*R.B.*

TEAC CD-W516E

EDITORS' RATING **7.8**

FEATURES	7	PERFORMANCE	8
INSTALLATION	8	VALUE	8

PROS: Buffer-underrun protection; includes Easy CD Creator 5
CONS: No troubleshooting information in manual; "basic" edition of software lacks several useful features

At $229.99, the Teac CD-W516E is the second-least-expensive drive in the group to include buffer-underrun protection. But the 16x/10x/40x CD-W516E also has the distinction of being a speed demon—at least with CD-RW media.

Teac's instruction manual covers installation in excellent detail, even devoting several pages to using the bundled software, a step other drive makers would do well to emulate. However, the booklet lacks troubleshooting information and fails to address the issue of buffer underruns (though there shouldn't be any—the drive's 2MB buffer should eliminate them).

The CD-W516E's benchmark numbers were a bit puzzling in some areas, but the results were commendable overall. It failed to keep pace with the PlexWriter, the only other 16x CD-R drive here, on the CD-R Write test, but posted some of the top CD-RW write scores among 10x drives, and its CD-RW read performance was the fastest we've seen to date. If you plan to use a lot of CD-RW media for tasks such as archiving data, the Teac will get the job done a bit quicker than the competition.

Teac supplies just one piece of software: Roxio's Easy CD Creator 5, which handles the basics of CD mastering and copying. It's an elegant and nicely integrated suite, though naturally we'd prefer the Platinum version, which offers significantly more capabilities.

Nevertheless, the Teac CD-W516E offers solid performance, the technology to guarantee flawless burns, and a price that's easier on the wallet than most of the competition.

< FEATURE COMPARISON >

	Pacific Digital TurboWriter 121032ei (BEST BUY)	Plextor PlexWriter 16/10/40A	Sony Spressa CRX160E/A1	Teac CD-W516E	Yamaha CRW2200EZ
DIRECT PRICE	$149	$249 (list)	$179.99	$229.99	$249.95
Rated Speeds (Write/Rewrite/Read)	12x/10x/32x	16x/10x/40x	12x/8x/32x	16x/10x/40x	20x/10x/40x
Interface	IDE	IDE	IDE	IDE	IDE
Buffer-Underrun Protection	Yes	Yes	No	Yes	Yes
OS Support	Windows 95, 98, 2000, Me, NT 4.x (with Service Pack 3 or higher)	Windows 95, 98, 2000, NT 4.x	Windows 95, 98, 2000, NT 4.x (with Service Pack 4 or higher)	Windows 95, 98, 2000, Me, NT 4.x	Windows 95, 98, 2000, Me, NT 4.x (with Service Pack 3 or higher)
Bundled Software	Acid XPress, FileCD, Musicmatch Jukebox, NTI CD Maker 2000, ZoneAlarm, additional software	DirectCD, Plextor AudioFS, Plextor Manager 2000, Roxio Easy CD Creator 4	ABCD, CD Complete Pro, CD Extreme, Mixman Studio, Retrospect Express, Spressa Liquid Player	Roxio Easy CD Creator 5	Adobe ActiveShare, Adobe PageMill 3.0, Adobe Photo-Deluxe, InCD, Musicmatch Jukebox 6.0, Nero Burning ROM 5.5, additional software
Kit Includes	IDE cable, audio cable, mounting screws	IDE cable, audio cable, mounting screws, one CD-R, one CD-RW	IDE cable, audio cable, mounting screws, one CD-R, one CD-RW	IDE cable, audio cable, mounting screws, one CD-R, one CD-RW	IDE cable, audio cable, mounting screws, Neato CD-labeling kit
Warranty	One year	One year	One year	One year	One year
Toll-Free Phone Support	No	Yes	Yes	No	Yes
BENCHMARK RESULTS					
CD-R Write Test (in K/sec)	1,453	1,715	1,530	1,648	1,994
CD-RW Write Test (in K/sec)	213	1,052	915	1,146	1,274
CD-R Read Test (in K/sec)	2,881	2,506	2,353	2,186	2,777
CD-RW Read Test (in K/sec)	881	2,547	1,414	3,145	743

HIGHER SCORES ARE BETTER

CD-RW DRIVES

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OSTIC

CD-RW
n't
like it

nasty
they hit
their storage limit. The problem has any number of causes—ordinary wear and tear, scratches, system crashes, leaving the disc in the drive when the system is shut down, or ejecting a disc before it has completed all of its writing functions. Making matters worse, the ScanDisk utility supplied by Roxio and other software vendors won't help you retrieve your data.

CD-R Inspector

All is not lost, however. CD-R Inspector, an $89.95 program from CD-ROM Productions, allows you to peer inside your malfunctioning discs. It can't repair them, but it does let you view your lost files and copy them to your hard drive. CD-R Inspector also lets you look for particular types of files (such as DOC, JPG, ZIP, or HTML), search for specific data in hexadecimal or character format, and generate disc-analysis reports. If the program can't identify a recovered file, it labels it "Unnamed" and attaches a file number. You can then use the accompanying FileIdentify utility to distinguish the file types and attach the appropriate extension.

CD-R Inspector is also capable of displaying extensive mastering, track, and session information, and, as such, is targeted more at CD developers and professional users than consumers. A better fit for casual users may be CD-ROM Productions' CD-R Diagnostic, which has much of the same functionality as CD-R Inspector but costs $40 less. Both programs are available as downloads through third-party vendors via CD-ROM Productions' Web site, or on disc for $10 more each.

—*Steve Schwartz*

PRODUCTS
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Lincolnshire, IL; 847-415-2377
www.cdrom-prod.com

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YAMAHA CRW2200EZ

EDITORS' RATING 8.0

FEATURES	8	PERFORMANCE	7
INSTALLATION	10	VALUE	7

PROS: Buffer-underrun protection; excellent documentation; industry-leading write performance
CONS: Complicated CD-mastering software; slow CD-RW read speed

As the only drive in the group with a 20x CD-R write rating, Yamaha's CRW2200EZ will no doubt appeal to speed-hungry buyers. Its competitive $249.95 price is also a plus. However, though it did scorch the competition in some of our benchmark tests, it does have an Achilles' heel.

Like the other four drives here, the CRW2200EZ isn't difficult to install, but Yamaha makes the job a pleasure by supplying an exemplary manual packed with illustrated step-by-step instructions, information on buffer underruns (and the technology employed by the drive to prevent them), and troubleshooting assistance. What's missing is a manual for Nero Burning ROM 5.5, the software bundled for CD mastering and copying. Although it's one of the most powerful programs of its kind, Nero is also one of the most complicated and confusing. Novices may want to steer clear of this drive for that reason alone.

Yamaha's software package doesn't end with Nero, however. You also get the MP3 program Musicmatch Jukebox 6.0, a CD label-design utility, and three Adobe apps, PageMill 3.0, PhotoDeluxe, and ActiveShare. It's a good collection overall, though the Adobe products seem out of place.

The preproduction drive we tested logged the highest CD-R and CD-RW write scores in the pack, and the second-highest CD-R read score, trailing the Pacific Digital drive by a narrow margin. However, its CD-RW read score was the lowest in the group, an anomaly most likely attributable to the Nero InCD utility used for CD-RW file operations. (The Pacific Digital drive exhibited a similar performance hiccup that vanished when we switched to DirectCD.)

The clear choice for power users, the Yamaha CRW2200EZ runs like a rocket, but it might slow down some users with its complicated CD-mastering software.

THE BURNING DESIRE

All five drives offer sizzling performance relative to last year's models, but we're compelled to recommend only those units that offer buffer-underrun protection. The Sony Spressa CRX160E/A1 has some strong points in its favor—most notably, its fast CD-RW formatting and low price—but we believe you'd be best served spending a little extra on a drive that's less likely to turn your CDs into landfill.

Of the four drives that incorporate the protection, the Pacific Digital TurboWriter 121032ei stands apart from the pack with an unbeatable price and a generous (though somewhat flawed) software bundle. We'd strongly recommend replacing its FileCD software with Roxio's DirectCD. Even with that added expense, the Pacific Digital still costs considerably less than its nearest competitor. ▼

< PRODUCT SUMMARY >

EDITORS' RATING (Rated 1 to 10)	8.3 BEST BUY	8.0	7.8	7.8	8.0
PRODUCT	Pacific Digital TurboWriter 121032ei	Plextor PlexWriter 16/10/40A	Sony Spressa CRX160E/A1	Teac CD-W516E	Yamaha CRW2200EZ
COMPANY	Pacific Digital Irvine, CA 800-486-7800, 949-252-1111 *www.1pdc.com*	Plextor America Santa Clara, CA 800-886-3935, 408-980-1838 *www.plextor.com*	Sony Electronics San Jose, CA 800-352-7669 *www.sony.com*	Teac America Montebello, CA 323-726-0303 *www.teac.com*	Yamaha Corporation of America Buena Park, CA 888-926-2426, 714-522-9011 *www.yamaha.com*
DIRECT PRICE	$149 34616	$249 (list) 34617	$179.99 34618	$229.99 34619	$249.95 34620

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AMD ATHLON 1.0GHZ	$ 856	CA905
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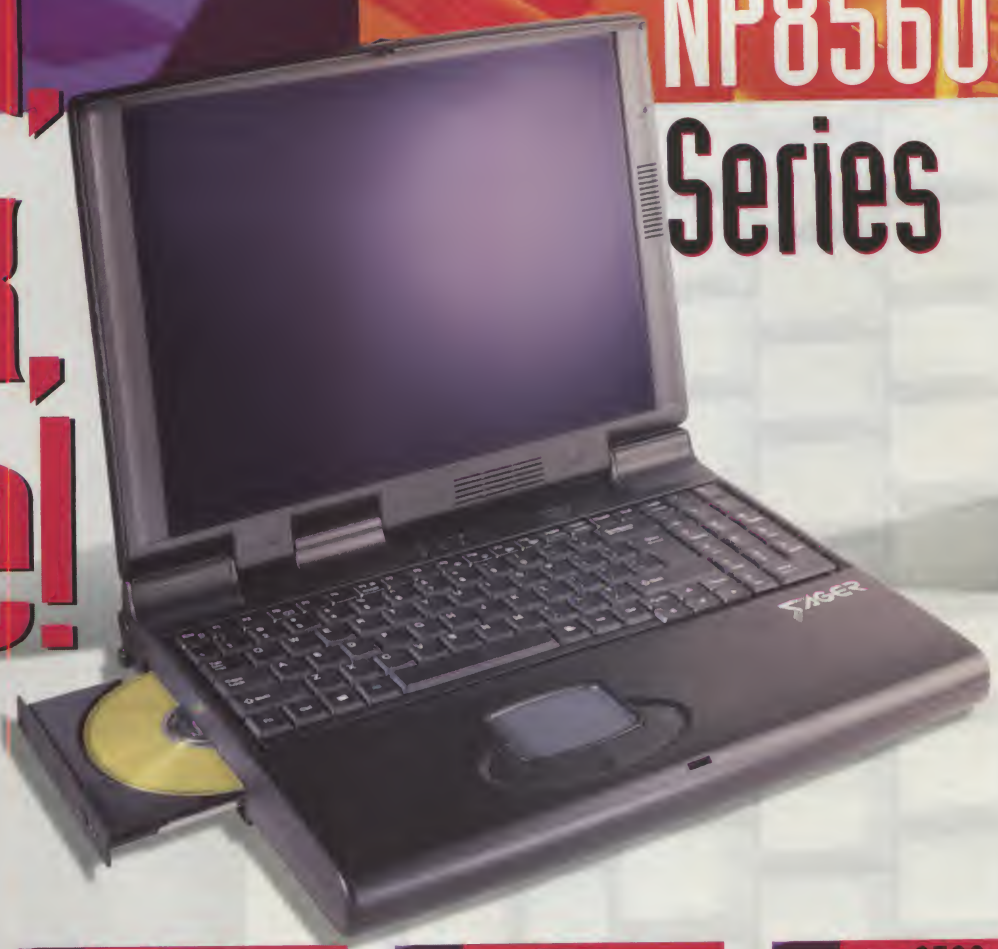

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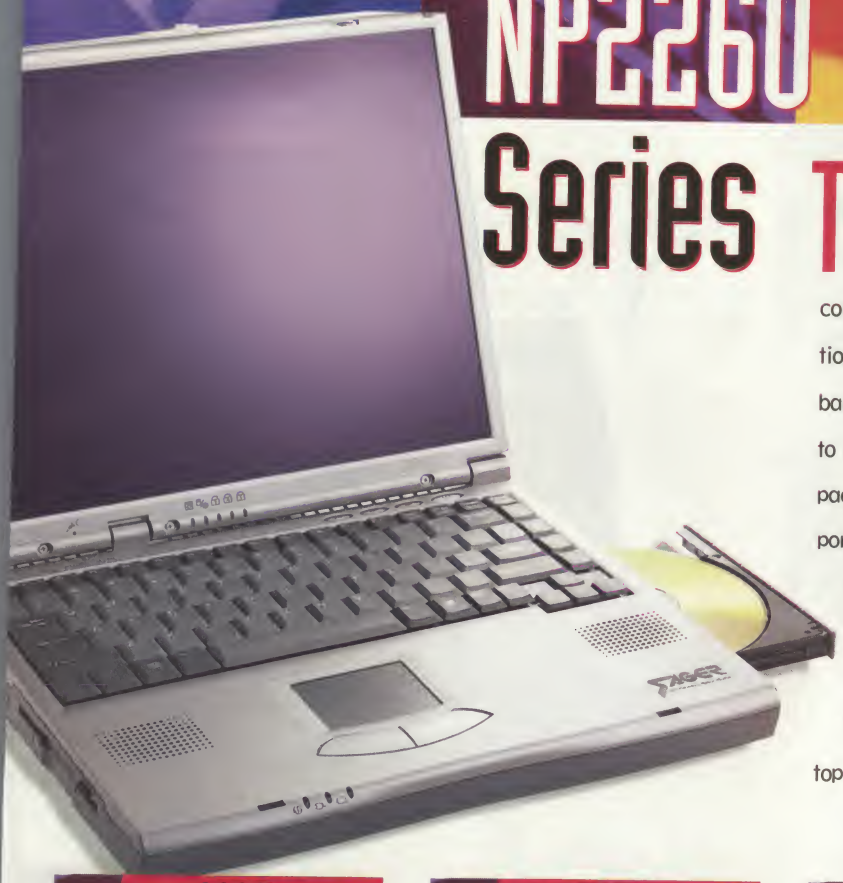

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- 8X Max. DVD-ROM Drive[2]
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- 1 IEEE-1394 Port and 1 TV-out Port
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- 20.0GB Ultra DMA Hard Drive
- 8X Max. DVD-ROM Drive[2]
- Integrated 56K V90 Modem[4] + 10/100 Ethernet
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- 256KB On-Die L2 Cache
- 3.5" 1.44MB Floppy Disk Drive
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- Smart Lithium-Ion Battery
- Built-In Touchpad Pointing Device
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- 24X Max. CD-ROM Drive[1]
- Integrated 56K V90 Modem[4] + 10/100 Ethernet
- 3 Hot-Keys for E-Mail, Browser and API
- 256KB On-Die L2 Cache
- 3.5" 1.44MB Floppy Disk Drive
- 3D Surround Sound
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- 1 Type II PCMCIA Slot
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Notes: 1, 2, 3: CD-ROM, DVD-ROM, and CD-RW drives list a variable read rate. CD-RW write and re-write speeds vary and list only the maximum possible speed. Actual CD-ROM, DVD-ROM, CD-RW speeds will vary and are often less than the maximum possible speed. 4: Maximum Transmission speed of up to 53Kps when downloading and 33.6Kps when uploading data. Actual speeds may vary depending on line conditions and current FCC restrictions.

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SHOPPER'S GUIDE TO MOTHERBOARDS

Updating THE BIG Board

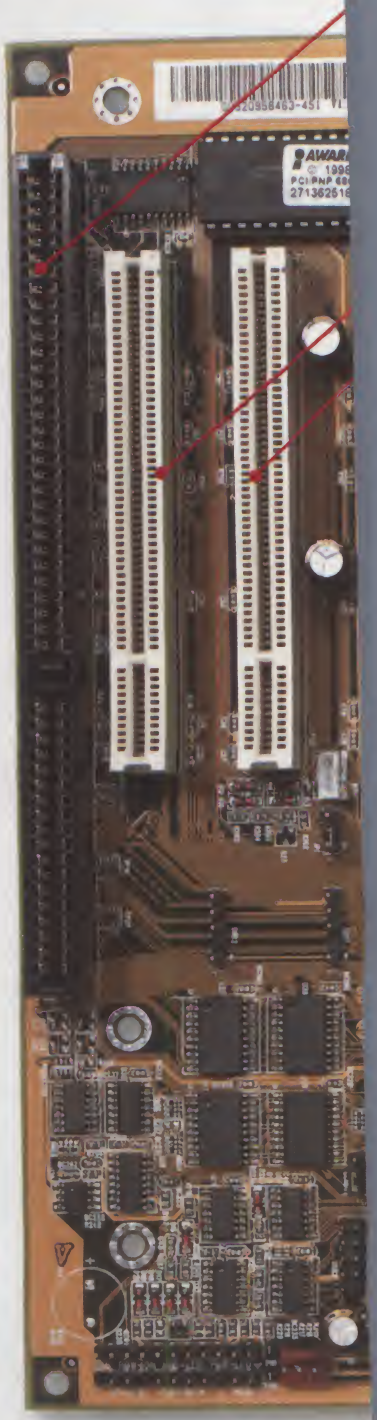
A STEP-BY-STEP GUIDE TO BUYING THE BEST MOTHERBOARD

BY DON LABRIOLA

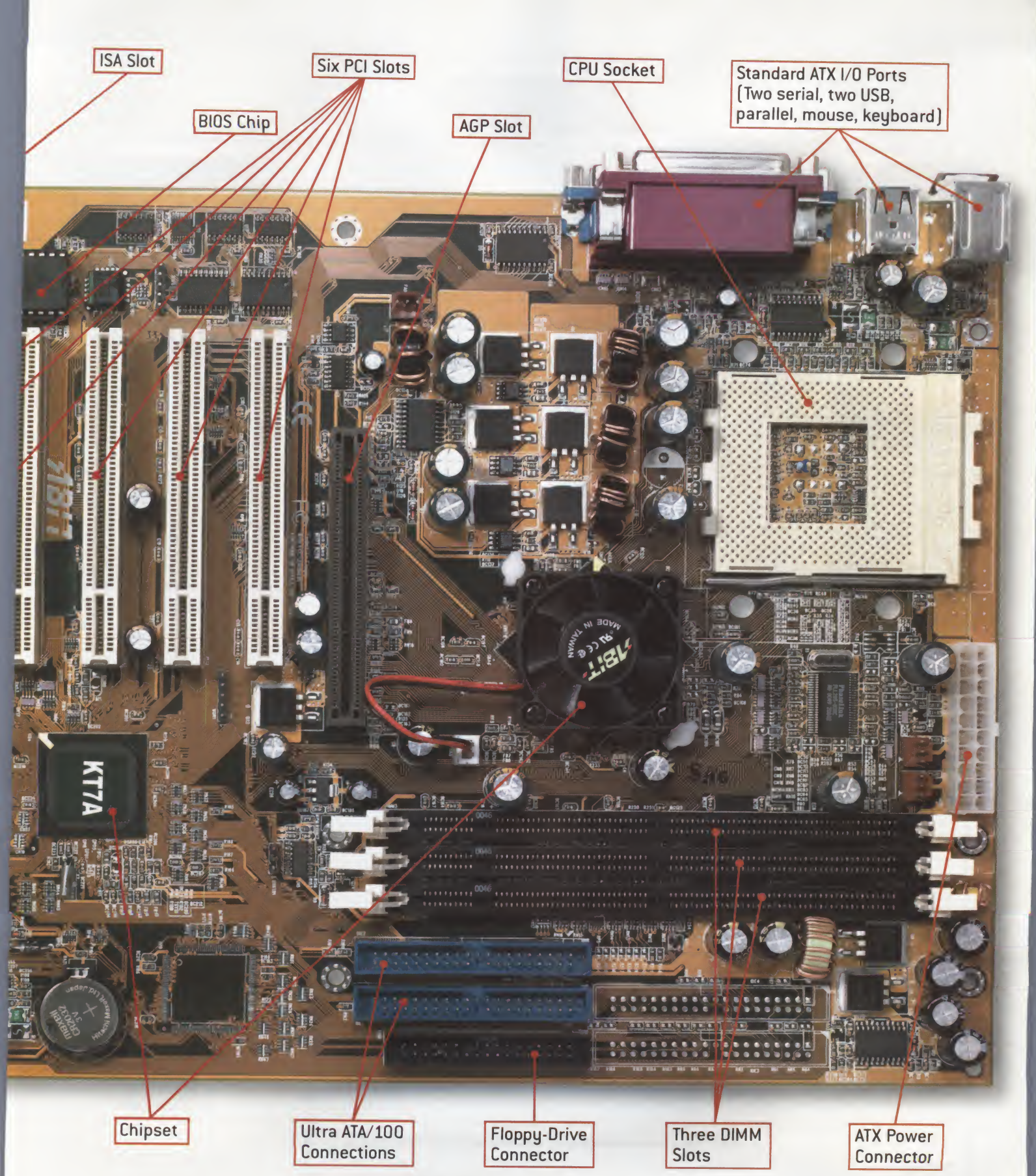
The thought of a motherboard upgrade was once enough to make even the gutsiest PC owner quake with fear. The job involved totally dismantling the system, struggling with potentially disabling hardware and software conflicts, and navigating a minefield of poorly documented BIOS entries, jumper-block settings, and unkeyed cables.

Things have changed. Installing a motherboard is still no job for neophytes, but it's now within the reach of most technically savvy users. The latest boards are highly standardized, lessening the chance of hardware incompatibilities, mismatched connectors, and impossible fits. Many ship with integrated graphics, sound, and communications capabilities that reduce the need for third-party hardware. Hard-soldered connectors have eliminated the rat's nest of cables that once connected motherboards to back-panel I/O ports. Best of all, because after-market motherboards are no longer sold only to professional integrators, most manufacturers now provide consumer-friendly documentation, warranties, and technical support.

Selecting a motherboard can still be intimidating if you don't know the ins and outs of processors, form factors, chipsets, and memory technologies. But it's hardly an impossible task. Whether you're building a machine from scratch or upgrading your old workhorse, here's what you need to know.



Abit's popular $119 KT7A delivers all the features you'd expect in a Socket A ATX motherboard. Details such as the precise positioning of some components and the exact number of slots and sockets may vary, but the general layout will be similar on any mainstream ATX board.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SHOPPER'S GUIDE TO MOTHERBOARDS

1 The Right Brainpower

It may seem counterintuitive, but your first step in choosing a motherboard should be to identify your CPU. Every processor fits into only one type of socket or slot, and should be installed only on motherboards that satisfy its specific cooling and voltage requirements.

Just as important is ensuring that your board's chipset is compatible with your new CPU. Chipsets govern almost every feature on a motherboard, including the type and amount of memory it can hold, the speed of its buses, and the way it moves data between the processor, peripherals, memory, and I/O ports. Dozens of wildly dissimilar chipsets are on the market today, and because vendors don't always implement every feature that a chipset supports, even boards containing the same chips can deliver different functionality.

Luckily, first-time buyers don't have to concern themselves with this level of detail. Most spec sheets list a motherboard's entire implemented feature set, including the clock rates, socket type, and bus speeds of the processors it supports. If you simply choose a board designated to be compatible with your specific CPU and evaluate other features on their own merits, details such as cooling mechanisms, supply voltages, and chipsets should take care of themselves.

Shopper's Tip

Don't be confused by ads for AMD Thunderbird processors. "Thunderbird" was simply AMD's code name for its most recent generation of Athlon processor chips, which offer on-die Level 2 cache.

MATCH UP CPUs AND SOCKETS

	Athlon	Celeron	Duron	Pentium III	Pentium 4
Manufacturer	AMD	Intel	AMD	Intel	Intel
Socket Type	Socket A	Socket 370	Socket A	Socket 370	Socket 423
Insider Tip	Avoid Athlons that require Slot A instead of Socket A motherboards; these older models were intended for OEMs.	Despite initially disappointing performance, newer-model Celerons run almost as fast as same-speed Pentium IIIs.	If you're short on cash, buying a Duron now will let you upgrade to an Athlon later without changing motherboards.	Stick with newer Pentium IIIs based on 0.18-micron architecture, which offer superior performance.	Next-generation Pentium 4s will require a 478-pin socket, which will be incompatible with current motherboards.
Bottom Line	Often matches the performance of higher-price Pentium III and Pentium 4 CPUs.	A popular lower-cost chip best used in budget systems.	A less expensive processor that compares favorably with the Celeron.	A good workhorse processor family that will meet most peoples' needs.	Delivers outstanding performance with applications written for its enhanced instruction set.

2 A Fitting Decision

Another important consideration is your board's form factor, which must match that of your case and power supply. Form factors define a broad range of characteristics that can include overall dimensions, mounting-hole placement, and the general layout and maximum height of components. Some leeway is allowed in many of these parameters, but even if motherboards with the same form factor don't always look exactly alike, they're still guaranteed to fit into any compatible chassis.

Most late-model motherboards conform to the compact ATX form factor, which incorporates cable-free I/O connectors that are physically soldered onto the board. A less expensive version called MicroATX further reduces physical dimensions, the number of I/O slots, and the size of the power supply, making it cost-effective for no-frills budget systems. Pentium 4 processors require their own variations on the ATX and MicroATX form factors that include special processor-retention holes and modified power connections. The smallest motherboards you're likely to see are those conforming to the older Flex ATX form factor, which was designed for reduced-footprint and low-profile cases.

Shopper's Tip

Avoid motherboards based on legacy form factors like AT, NLX, and Baby AT. Even if it means replacing your existing case and power supply to accommodate a newer board, doing so is an inexpensive way to ensure future expandability.

FIND THE RIGHT FORM

	Maximum Width	Maximum Depth	Intended For	Bottom Line
ATX	12 inches	9.6 inches	General-purpose systems	Still the dominant form factor.
Flex ATX	9 inches	7.5 inches	Small-footprint desktops	Quickly being superseded by MicroATX.
MicroATX	9.6 inches	9.6 inches	Budget PCs	Increasingly popular low-cost version of ATX.
Pentium 4-Modified ATX and MicroATX	12 inches/ 9.6 inches	9.6 inches	Pentium 4-based computers	Require a Pentium 4-compatible case and power source.

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3 Memory Matters

All motherboards require memory modules that are compatible with the board's chipset and memory slots. You'll get the best performance by also matching RAM speed to that of the board's system bus or front-side bus (FSB), which connects the CPU to the chipset, memory, and other components. Check your motherboard spec sheet to determine which type of memory it supports.

Shopper's Tip

Don't assume that the number of memory slots determines a motherboard's maximum RAM capacity. This figure is defined by the chipset, and many vendors add extra slots simply to increase flexibility.

The most common memory technology used today is SDRAM, which is usually sold in 100MHz PC100 and 133MHz PC133 configurations. A newer option is double-data-rate (DDR) SDRAM, which theoretically moves twice as much data at the same bus speed. DDR SDRAM is currently available in two types: PC1600 for systems with 100MHz buses, and PC2100 for 133MHz buses.

Rambus DRAM (RDRAM) is a pricier, high-speed alternative that is the only option for Pentium 4 motherboards today. (Upcoming chipsets will allow Pentium 4s to work with other types of RAM.) Despite moving fewer bits per bus clock cycle than SDRAM, RDRAM modules produce high bandwidth by running at faster bus speeds. The latest RDRAM-compatible chipsets further boost performance by allowing two or four channels of memory data to be transferred at the same time, so it's important to verify how many simultaneous memory channels are supported when comparing RDRAM motherboards.

RESEARCH THE RAM

	Slot Type	Most Popular Speeds	Matching Bus Speed	Bandwidth (Theoretical Maximum)	Bottom Line
SDRAM	168-pin DIMM	PC66 PC100 PC133 PC150	66MHz 100MHz 133MHz 155MHz	0.5GB per second 0.8GB per second 1.1GB per second 1.2GB per second	Still the standard in most motherboards for now.
DDR SDRAM	184-pin DIMM	PC1600 (PC200) PC2100 (PC266)	100MHz (DDR 200MHz) 133MHz (DDR 266MHz)	1.6GB per second 2.1GB per second	Higher bandwidth at a similar cost to SDRAM; should eventually replace standard SDRAM.
RDRAM	184-pin RIMM	PC600 PC700 PC800	266MHz 356MHz 400MHz	1.1GB per second per channel 1.4GB per second per channel 1.6GB per second per channel	Pricey, but can theoretically produce a jaw-dropping 3.2GB-per-second bandwidth on dual-channel motherboards.

Three Boards That Illustrate the Latest Trends in Design

The **Intel 850GB** is the quintessential Pentium 4 motherboard. Employing the new Pentium 4-modified ATX form factor, it's based on the Intel 850 chipset, which provides a 400MHz system bus, blazing-fast 3.2GB-per-second dual-channel RDRAM bandwidth, and optional support for the new USB 2.0 specification.
*($192 mfr. est., **www.intel.com,** 877-649-5817)*

The **Soyo SY-7IS2** is a solid mainstream Socket 370 motherboard that will fit the needs of most users interested in a Pentium III or Celeron system. It offers a standard ATX footprint, integrated audio capabilities, three PC133 SDRAM slots, and robust expansion capabilities that include six 32-bit PCI slots, a CNR connector, and a 4x AGP slot. It also provides a full complement of I/O ports and connectors, and Ultra ATA/100 disk I/O.
*($145 list, **www.soyo.com,** 510-226-7696)*

The **AOpen MK7A** is a late-model Socket A offering that incorporates many of the latest trends in motherboard technology. Based on the new MicroATX form factor, it supports both Athlon and Duron processors and packs one 4x AGP and three PCI slots, AC97 audio, and all standard I/O ports into a compact 9.5-inch-square board. Its AMD 761 chipset also provides a 266MHz DDR system bus that supports a pair of PC2100 DDR SDRAM modules.
*($149 mfr. est., **www.aopen.com,** 888-852-6736)*

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4 Connections Are Everything

Unless you're building a legacy-free system, don't consider any motherboard that lacks the standard array of two 16550 serial, one ECP/EPP parallel, and two PS/2-style keyboard and mouse ports. Also look for up to eight USB ports, including one or more internal USB pin connectors designed to be manually wired to jacks in a back-panel plate.

Shopper's Tip

If an otherwise great-looking motherboard offers only a few USB ports, don't be deterred. External USB hubs that convert one port to four are inexpensive and easy to hook up.

In addition to an onboard floppy connector, every motherboard should provide a pair of Enhanced IDE pin connectors that together let you attach four ATAPI hard drives, tape drives, or optical drives. Look for boards that offer speedy 100MHz Ultra ATA/100 (Ultra DMA/100) IDE buses in addition to the slower ATA/66 and ATA/33 versions.

Nearly all modern motherboards provide one 4x AGP and at least a few PCI slots, and some models even offer one or two ISA slots. Motherboards with built-in communications and multimedia capabilities may also provide a slot for Audio/Modem Riser (AMR) or Communications and Networking Riser (CNR) cards. These multifunction I/O boards allow Ethernet, modem, HomePNA, DSL, audio, USB, and other connectors to be combined on a single add-in card.

CONSIDER ALL THE SLOTS

Type	What You Need	Bottom Line
Accelerated Graphics Port (AGP)	One 4x AGP slot	Provides a high-speed bus for the latest graphics boards.
Audio/Modem Riser (AMR)	One shared AMR/PCI slot	Accommodates AMR-standard riser boards for motherboard-implemented sound and modem functions.
Communications and Networking Riser (CNR)	One CNR Slot	Accommodates special CNR add-in cards that provide multiple I/O ports for integrated communications functions.
Industry Standard Architecture (ISA)	One or two ISA slots	Necessary only if you need to install legacy ISA boards.
Peripheral Component Interconnect (PCI)	One to six PCI slots	Currently the most common standard for add-in boards.

5 Topping It Off

Today's motherboards deliver luxuries like SCSI, modem, and Ethernet ports; line-in, mic-in, and speaker/headphone jacks; NTSC TV inputs and outputs; MIDI/game ports; DVI flat-panel and VGA monitor outputs; IEEE 1394 (FireWire) interfaces; infrared ports; and S/PDIF digital-audio interfaces. Motherboard-based implementations of these features usually cost less and produce fewer conflicts than do add-in boards; just verify that they can be disabled should you run into hardware conflicts or decide to upgrade.

Shopper's Tip

If you buy a motherboard with any built-in multimedia or communications features, be sure that it ships with standard jacks and mounting hardware. Some provide only onboard pin connectors that require you to add your own cabling and back-panel plates.

Many offer wake-up functions that automatically turn on your PC at a scheduled time, or power up when the system detects activity from a phone line, a LAN connection, or a keyboard, mouse, or USB port. Also look for hardware-supported Suspend-to-RAM and Suspend-to-Disk shutdown functions that let you quickly restart your system in the state it was in, as well as security, hardware-monitoring, and remote-management features.

Also key is the Basic Input/Output System (BIOS), which, at startup, initializes and tests the hardware before loading the OS. Most of today's advanced BIOS chips can be easily updated by "flashing" them with a software utility. But because the ability to alter a BIOS makes it vulnerable to viruses, many newer motherboards let you selectively write-protect their BIOS chips. Some even offer read-only "rescue" chips that can be used to restore infected BIOS data.

SWEAT THE SMALL STUFF

Feature	What It Does	Bottom Line
AC97 2.2	Provides onboard analog and digital audio, and 56kbps modem.	Saves you the hassle of adding a modem and sound card.
BIOS ROM Backup and Rescue	Stores default BIOS settings in unalterable ROM memory.	Lets you restore your BIOS to its original state if it becomes infected or corrupted.
BIOS Write-Protect	Locks your system's BIOS settings.	A great way to prevent BIOS viruses.
Hardware Monitoring	Notifies when parameters such as supply voltages, fan speed, or internal temperature fall outside specified limits.	Helps prevent catastrophic hardware failures.
Intrusion Detection	Notifies when a computer's chassis is opened.	Thwarts unauthorized system modifications and thefts.
Suspend-to-RAM/ Suspend-to-Disk	Stores the current system state to memory or to a hard drive when you shut down.	Decreases the time it takes to start up or shut off the system.
Wake-on-Ring/LAN/ Keyboard/Mouse/USB	Automatically turns on your computer when it detects input.	Facilitates automated network or telephone-answering functions.

AND KEEP IN MIND

Look for vendors that provide three-year warranties, agree to accept returns without a restocking fee, and offer 24/7 toll-free live technical support.

Equally important are ease-of-use features and the quality of a board's accessory bundle. Jumperless motherboards automatically detect parameters such as bus speeds, CPU clock rate, and supply voltages. If the board ships with back-panel plates or detached I/O connectors, verify that the package contains any necessary cables. Every motherboard should also include diagnostic features.

The documentation should provide detailed hardware and software installation instructions, complete specifications, jumper and BIOS configuration tables, a troubleshooting guide, and a detailed drawing locating every major component. ▼

SECTION CONTINUES ON PAGE 128

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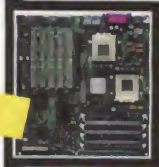

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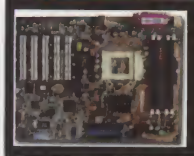

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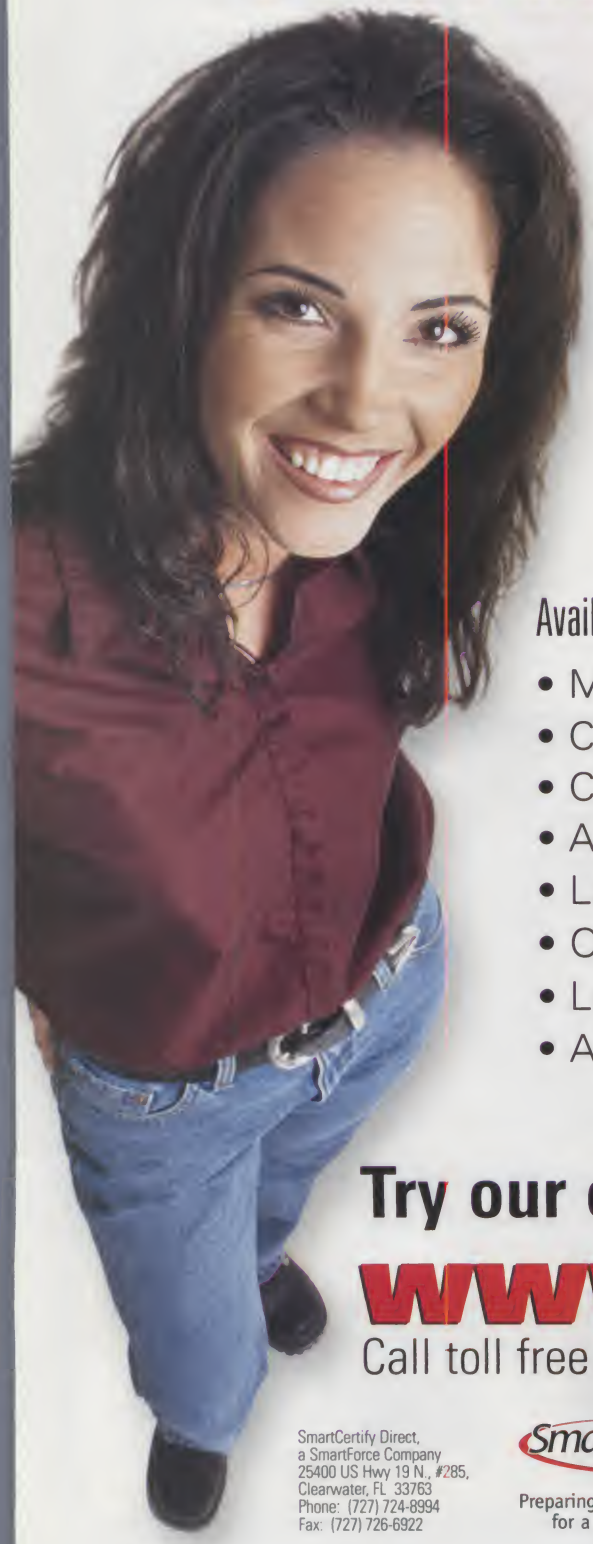

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Best Buy, Computer Buyer's Guide, August, May 2000

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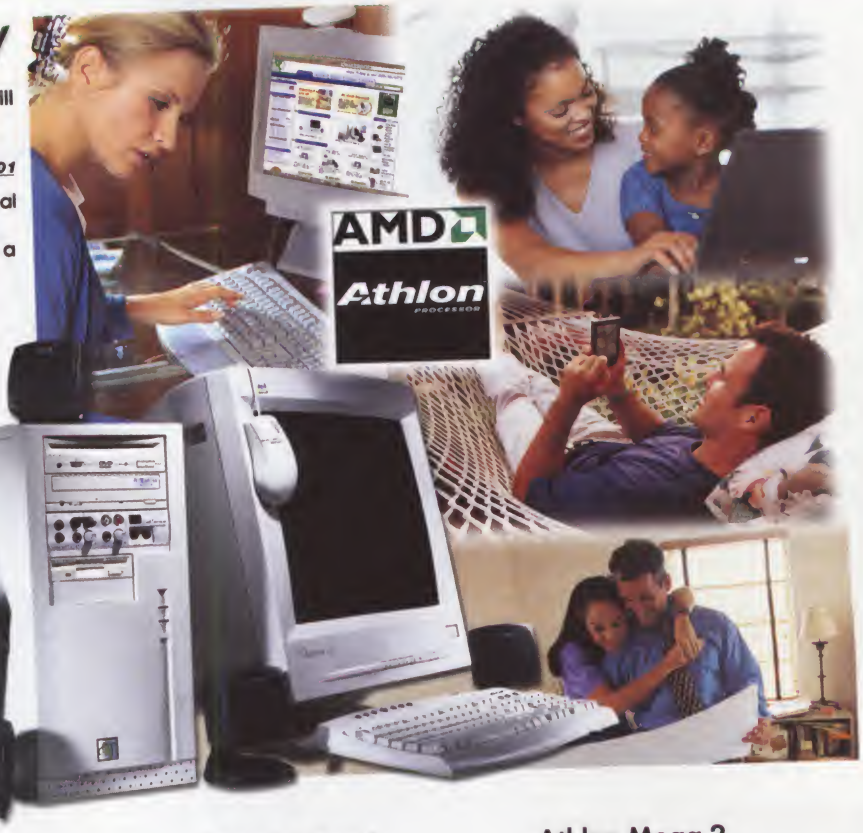

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- 16X DVD-ROM Drive
- Nvidia GeForce 2 MX 4X AGP 32MB Video Card w/TV-Out
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- 16X DVD-ROM Drive
- Nvidia TNT2 M64 w/32MB 4X AGP Video Card
- Creative Labs SoundBlaster PCI 128 Sound Card
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- Creative Labs SoundBlaster PCI 16 Sound Card
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DIGITAL VIDEO EDITORS

MOVIE Makers

Four Digital-Video Editors That Add Hollywood Effects To Your Home Movies

by Don Labriola

Have you ever fantasized about transforming those dusty old family videotapes into spiffy new Video CDs, or impressing your colleagues by adding eye-popping movie clips to your e-mail messages, presentations, or Web site? It's easier than you think.

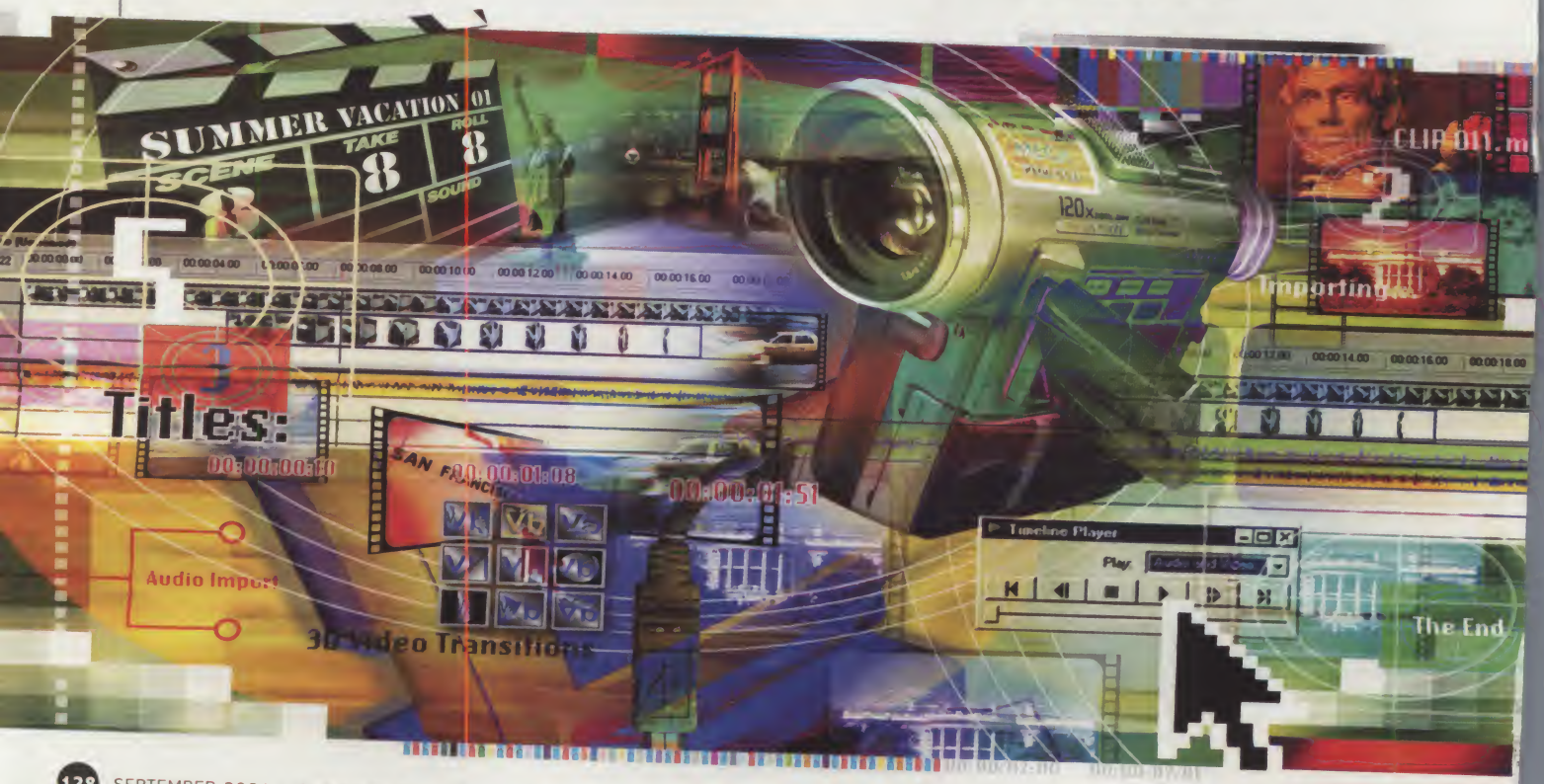
Today's low-cost video-editing programs may lack high-end features such as precision color correction, audio-waveform-editing capabilities, and plug-in architectures, but they do offer jaw-dropping special effects and titling capabilities, surprising ease of use, and built-in templates that make it simple to connect with prosumer, mainstream, and even legacy VHS video equipment.

One reason personal video production is exploding in popularity is the proliferation of affordable desktop Webcams, as well as MiniDV and Digital8 camcorders that support digital video (DV). Fast USB and IEEE 1394 (FireWire) interfaces, multigigabyte hard drives, CD recorders, and broadband Internet connections have also made it easier to download and manage huge video files on a PC. In addition, the Apple iMovie and Microsoft Windows Movie Maker video-editing applets have further increased awareness of the medium's possibilities.

Today's video-editing packages make it easy to record videotapes onto digital storage media and to transfer videos from your PC to videotape. Old clips can be spruced up with dazzling effects and slick soundtracks, incorporated into electronic greeting cards, or uploaded to video-album Web sites where friends can view them at their convenience. Businesses can enhance presentations with embedded clips; create training, recruitment, or promotional videos; record company events; and even distribute in-house productions on CD-R media.

In this roundup, we survey four of the latest mainstream video editors. All sell for under $150, capture high-quality DV source material, and are designed to make the task of producing professional-looking output as simple as possible. Most also work with older analog video equipment, and all provide a huge assortment of drag-and-drop special effects, easy-to-use templates, and bundled media libraries. Looking good onscreen was never so easy.

ILLUSTRATION BY ERIC YANG



DIGITAL VIDEO EDITORS

DAZZLE MAINACTOR 3.56

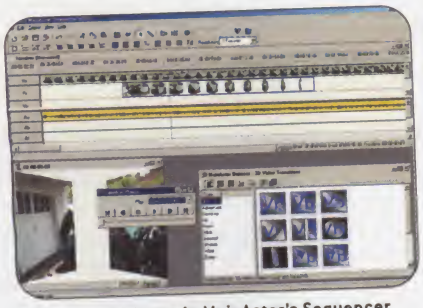
EDITORS' RATING 7.0

EASE OF USE	6	SERVICE AND SUPPORT	9
FEATURES	8	VALUE	7
PERFORMANCE	5		

PROS: Powerful 3D effects; great 3D titling module; audio filters and effects
CONS: Broken into stand-alone modules; no direct videotape output; no predefined input or output templates

The $149.99 Dazzle MainActor 3.56 is a near-miss. Despite some powerful features, it lacks the ease of use and integrated front end offered by most video-editing packages that target the consumer market.

Unlike the other programs we tested, MainActor is split into five poorly integrated stand-alone programs. Transferring video to or from a DV camcorder is performed by MainActor's basic-black DV-Capture and DV-Out applications, and a third module is required to capture from analog devices. All three force you to manually enter the correct video settings and save them as templates.



The animated icons in MainActor's Sequencer make it easy to visualize sophisticated 3D transitions and effects.

MainActor also includes a quirky VideoEditor program that edits a video clip as a sequence of still images, and a timeline-based Sequencer module, laden with idiosyncratic features such as the ability to insert flying geometric objects, synthesizer sounds, and fractal graphics into a movie.

In other ways, MainActor is a powerful, flexible offering. It can layer 98 video and 98 audio tracks on a timeline, and provides a terrific selection of 2D and 3D effects, 3D text-animation features, sophisticated transitions, and even a morphing module. It includes excellent documentation and a superior software bundle, and offers the most useful audio filters and effects in the roundup. Nonetheless, MainActor's awkward architecture, sometimes-clunky editing tools, lack of predefined templates, and slow rendering times make it hard to recommend with enthusiasm.

MGI VIDEOWAVE 4

EDITORS' RATING 7.8

EASE OF USE	9	SERVICE AND SUPPORT	8
FEATURES	7	VALUE	8
PERFORMANCE	7		

PROS: Intuitive, easy-to-use interface; large selection of templates; blue-screen compositing
CONS: Requires 1,024-by-768 display; accuracy of automatic scene detection depends upon input video quality

The $99 VideoWave 4 from MGI isn't the most powerful program in the roundup, but it does manage to pack almost everything a fledgling auteur really needs into a remarkably simple interface.

VideoWave has an intuitive storyboard-based workspace and provides an outstanding selection of consistent, easy-to-learn drag-and-drop editing procedures. Its rich feature set helped us create with ease high-quality effects, flashy animated text, and slick soundtracks culled from a variety of sound sources.

VideoWave ships with a large collection of device-specific video-capture templates that let you set video parameters with a single click, as well as flexible output templates that automatically adjust settings for VHS video equipment or DV camcorders. Other templates make it easy to produce streaming video files and attach them to e-mail messages or upload them to a Web portal for public viewing. The program even provides tools for exporting clips to greeting cards, presentations, and other types of video-enhanced documents.

If all this isn't enough, VideoWave also offers a generous bundle of audio and video clips, as well as a sprinkling of advanced features such as fast- and slow-motion effects, and blue-screen video compositing. It's a great way for newbie filmmakers to quickly begin generating great-looking output.

VideoWave's intuitive Storyline represents a movie as a filmstrip with a single thumbnail for each scene.

PINNACLE STUDIO DV

EDITORS' RATING 8.2

EASE OF USE	9	SERVICE AND SUPPORT	7
FEATURES	8	VALUE	9
PERFORMANCE	8		

PROS: Elegant interface; can capture compressed video; top-notch titling module; superior soundtrack-generation and audio-mixing functions; flexible Scene Detection options; bundled IEEE 1394 card
CONS: No analog video capture; no output to analog tape; no 3D effects or transitions; free phone support lasts only 90 days

ZD Net BEST BUY

There's little to dislike about Pinnacle Systems' $89 Studio DV. This DV-only video editor offers a comprehensive feature set, an outstanding interface, and even a bundled IEEE 1394 interface board. It delivers an impressive combination of ease of use, power, and value.

New users will be especially impressed by the program's three-step guided workflow. Clicking the Step 1 Capture tab brings up a refreshingly easy-to-use graphical control panel that resembles a camcorder's tape transport. The Step 2 Edit tab displays a cleverly designed editing screen filled with learning aids such as ToolTips, right-click pop-up menus, and even a Status Line that explains why the program won't let you perform illegal actions. The final step invokes a Make Movie mode, which lets you easily output movies to DV devices, a TV monitor, or disk files.

Capturing video with Studio DV is easy, thanks to an intuitive interface built around familiar visuals.

Another strength is the program's ability to capture and edit lower-quality video, which requires a mere 160MB per hour of storage, and then automatically recapture full DV-quality footage when creating the final production. A nifty soundtrack generator creates scores that match the exact duration of your movie, and the program also excels in areas such as titling, audio processing, and rendering speed. If you can live with an editor that handles only DV source material, you'll find Pinnacle Studio DV difficult to beat at this price.

ULEAD VIDEOSTUDIO 5.0 DVD EDITION

EDITORS' RATING **8.0**

EASE OF USE	8	SERVICE AND SUPPORT	8
FEATURES	9	VALUE	8
PERFORMANCE	7		

PROS: Flexible output options; DVD-R recording; fast MPEG-2 rendering; excellent interface; batch capture
CONS: No fast- or slow-motion effects; no real-time video preview

Another impressive contender is Ulead VideoStudio 5.0 DVD Edition. Despite costing about $40 more than Studio

Modeled after a video-workstation console, VideoStudio's spiffy interface toggles between timeline and storyboard modes.

DIGITAL VIDEO EDITORS

What's What in the Feature-Comparison Chart

- **Audio/video filters:** Special effects that can be applied to audio and video clips. Common video filters are blur, negative, and black and white. Audio versions can include reverb, echo, and noise-reducing notch filters.
- **Audio/video split:** The ability to split a movie clip into separate audio and video tracks, which lets you manipulate the two independently on a timeline.
- **Compositing:** A method of blending objects from one video clip into another. Frequently called blue-screen compositing, this technique is often used to create overlaid titles and credits.
- **Native editing:** The ability to edit a video clip in its original format, without the degradation that would occur if your application first converted the clip to an editor-friendly intermediate format.
- **Only render edited frames:** A performance-enhancing feature that improves output quality and speed by rerendering only frames that have been edited.
- **Real-time voice-overs:** The ability to record narration with a microphone as a video clip is playing.
- **Scrubbing:** The ability to quickly preview part of an audio or video clip by moving a slider or passing the cursor over it.
- **Templates:** Collections of predetermined video and audio settings that let you perform tasks such as capturing video from a camcorder or creating a specific type of video file with a single click.
- **Transitions:** Special effects that are used to connect two scenes. Common types of transitions include fades, wipes, and dissolves.

< FEATURE COMPARISON >

	Dazzle MainActor 3.56	MGI VideoWave 4	Pinnacle Studio DV (BEST BUY)	Ulead VideoStudio 5.0 DVD Edition
CAPTURE				
Video-Capture Formats	DV, MPEG-1, MPEG-2, and any other formats supported by capture-device driver	DV, MPEG-1, MPEG-2	DV	DV, MPEG-1, MPEG-2
Batch Capture	No	No	Yes	Yes
Number of Capture Templates/Presets	None	153 (device-dependent)	Two	30
Users Can Create Custom Capture Templates	Yes	Yes	No	Yes
Automatic/Manual Scene Detection	No/no	Yes/yes	Yes/yes	Yes/yes
VIDEO EDITING				
Timeline or Storyboard Interface	Timeline	Storyboard	Both	Both
Maximum Number of Video Tracks on Timeline/Storyboard	98	One (second available through compositing)	One	Two
Real-Time Preview	Yes	Yes	Yes	No
Number of Transitions	52	60	More than 100	112
Number of Video Effects and Filters	30	37	None	30
3D Video Effects, Filters, or Transitions	Yes	No	No	Yes
Video Compositing/Overlays	Yes	Yes	No	Yes
Fast/Slow Motion	Limited	Yes/yes	No/no	No/no
Video/Audio Scrubbing	No/no	Yes/yes	Yes/no	Yes/yes
Native DV/MPEG-2 editing	Yes/yes	Yes/yes	Yes/no	Yes/yes
Number of Titling Effects and Paths	No presets, user-definable	28 (can add custom templates)	More than 100	16 paths
Number of Undo/Redo Levels	99/99	One/one	Unlimited	99/99
AUDIO EDITING				
Input Audio Formats	WAV, MP3, QT, AIF, AU	CD-Audio, WAV, MP3	CD-Audio, WAV	CD-Audio, MPEG-1, MPEG-2, QT, WAV, AIF, AIFC, AIFF, AU, AVI, MOV, MP3
Number of Audio Effects and Filters	Nine	None	None	None
Number of Audio Tracks on Timeline	98	Six stereo	Three stereo	Two mono
Audio/Video Split	Yes	Yes	No	No
Real-Time Voice-Over Recording	No	No	Yes	Yes
OUTPUT				
Output Video Formats	AVI, DV, MPEG-1, MPEG-2, QuickTime, MJPEG, FLI/FLC, animated GIF, RealVideo 8, ASF, WMV	RealVideo 7, WMV, AVI, DV, MPEG-1, MPEG-2	DV, AVI, MPEG-1, MPEG-2, RealVideo 8	AVI, MPEG-1, MPEG-2, WMV, RealVideo 8, CT, MOV
Output Devices Supported	PC hard drive, DV devices	PC hard drive, VHS videotape, DV devices, analog camcorders	PC hard drive, TV monitors, DV devices	PC hard drive, VHS videotape, DV devices, Hi-8 camcoders, DVD-R, CD-R/CD-RW, Video CD, SVCD
Codecs Provided	DV, MPEG-1, MPEG-2, MJPEG	DV, MPEG-1, MPEG-2, Indeo, WMV, RealVideo 7	DV, MPEG-1, MPEG-2, Indeo RT	DV, MPEG-1, MPEG-2, Indeo, Cinepak, QuickTime 4, MOV, RealVideo 8, WMV
Number of Output Templates	11	33 (can add custom templates)	Eight	16
Background Rendering	Yes	No	No	No
Only Render Edited Frames	DV and MJPEG only	DV only	Yes	Yes

DIGITAL VIDEO EDITORS

How We Tested

Sometimes the trickiest thing about DV editing is finding an IEEE 1394 interface that works with both your camcorder and PC. For this reason, we built our testbed exclusively from Sony equipment, which we've found in the past to be especially forgiving.

Our test system was a video-friendly $2,600 Sony VAIO PCG-XG500 notebook equipped with a 700MHz Pentium III processor, 128MB of SDRAM, a 13.3-inch TFT display, 8MB of video SGRAM, and a Sony CXD 3222 OHCI-compatible i.Link/IEEE 1394 interface. We also used a $1,799 Sony DCR-PC110 MiniDV camcorder, which is the latest version of the award-winning DCR-PC100 model.

We tested each program by capturing 15 minutes (about 6.5GB) of DV footage. Paying special attention to each program's learning aids, overall ease of use, and performance, we added soundtracks, rearranged and trimmed clips, inserted transitions, applied the effects each program provided, and then transferred the finished movie back to the Sony camcorder. Finally, we captured another 2-minute DV clip and measured the time it took to render the unedited footage into 30-frame-per-second (fps) 320-by-240 MPEG-1 and 29.97fps 720-by-480 MPEG-2 files.

Every DV Editor Interface Should Have:

Media Library: A storage area for video clips, audio tracks, transitions, effects, and other types of objects that you assemble into a finished movie by dragging to a timeline or storyboard.

Video Preview Window: Contains controls and a view window that let you review video clips, effects, and transitions.

Storyboard: A flowchart-like representation of a movie that displays each scene as a single thumbnail. Most storyboard-based programs let you apply a transition to a pair of scenes by dragging its icon to the space between two thumbnails.

Timeline: A linear representation of a movie that shows each video clip, audio track, or transition as an object whose length is proportional to its duration in time. You can usually trim and rearrange objects on a timeline by simply dragging their right and left edges.

< COMPUTER SHOPPER BENCHMARKS >

Rendering Test Times (Minutes: Seconds) — LOWER SCORES ARE BETTER

	Dazzle MainActor 3.56	MGI VideoWave 4	Pinnacle Studio DV	Ulead VideoStudio 5.0 DVD Edition
MPEG-1 Output	07:32	04:52	04:32	05:14
MPEG-2 Output	27:10	16:09	12:08	07:52

DV and lacking an IEEE 1394 interface card, in many ways VideoStudio offers even more power and flexibility than the Pinnacle package.

Both programs are rich with learning aids such as pop-up menus, ToolTips, comprehensive help, and a guided workflow. They both also offer slick features like real-time voice-overs, audio-CD ripping, and outstanding dual timeline/storyboard interfaces. The two look very different, and we found the Pinnacle interface a bit easier to navigate.

VideoStudio does, however, have a significant edge in I/O flexibility, supporting both analog and digital capture, as well as the ability to output directly to VHS, Hi-8, DV, CD-R, CD-RW, Video CD, Super Video CD (SVCD), and even DVD-R. It also offers a huge selection of editable 2D and 3D effects and transitions, as well as advanced features such as audio scrubbing, alpha-channel video overlays, and support for the new Pentium 4 instruction set.

Our biggest beef is the program's lack of a real-time preview, which requires effects and transitions to be rendered before viewing them onscreen, a process that can be time-consuming. But in all other ways, Ulead VideoStudio 5.0 DVD Edition is a winner.

< PRODUCT SUMMARY >

EDITORS' RATING (Rated 1 to 10)	7.0	7.8	8.2 BEST BUY	8.0
PRODUCT	Dazzle MainActor 3.56	MGI VideoWave 4	Pinnacle Studio DV	Ulead VideoStudio 5.0 DVD Edition
COMPANY	SCM Microsystems Fremont, CA 510-360-2300 www.dazzle.com	MGI Software Richmond Hill, ON, Canada 888-644-7683, 905-764-7000 www.mgisoft.com	Pinnacle Systems Mountain View, CA 317-841-0332 www.pinnaclesys.com	Ulead Systems Torrance, CA 800-858-5323, 310-896-6388 www.ulead.com
REQUIRES	266MHz Pentium II or 300MHz AMD K6-2; 32MB RAM (64MB recommended); 32MB hard drive space (for program), up to 230MB (for bonus apps and footage), 1GB (for video); 8x CD-ROM; analog video-capture hardware; OHCI-compliant IEEE 1394 card or port for DV capture; Windows 98, 2000, Me, or NT	266MHz Pentium II; 64MB RAM; UDMA hard drive with 45MB (for program) and 1GB (for video); 1,024-by-768 24-bit display; analog video-capture hardware; OHCI-compliant IEEE 1394 for DV capture; Windows 98, 2000, or Me	233MHz Pentium or equivalent processor; 64MB RAM; free PCI slot or PC with IEEE 1394 port; DirectX-compatible graphics and sound cards; DV or Digital8 camcorder or VCR with IEEE 1394 port; Windows 98, Me, or 2000	500MHz Pentium III (optimized for Pentium 4); 64MB RAM (128MB recommended); 300MB hard drive space (4GB recommended); CD or DVD drive; TV tuner; USB capture device or video-capture board for analog capture; OHCI IEEE 1394 card for DV capture; Windows 98, 2000, Me, or NT 4.0 with Service Pack 6
MFR. EST. PRICE	$149.99 (before $50 rebate, valid through October) 34631	$99 34632	$89 34633	$129.95 34634

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THE BOTTOM LINE

Of the packages we reviewed, Dazzle MainActor 3.56 was the roughest, with a clunky architecture. MGI VideoWave 4 has an easy-to-learn interface that makes it a great choice for first-time users. Pinnacle Studio DV and Ulead VideoStudio 5.0 DVD Edition are both powerful, well-designed packages that should do the job for most personal-video enthusiasts. VideoStudio offers faster MPEG-2 rendering times and arguably superior features, but we preferred the Pinnacle package by a small margin because of its lower price, bundled IEEE 1394 board, excellent titling module, and real-time preview capabilities. ▼

SECTION CONTINUES ON PAGE 136

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FinePix 4800/6800	Call/689

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PL 500 USB/Serial	Call/Call

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VIDEO EDITING

DAZZLE

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FREE SOFTWARE FOR PC FINE-TUNING

Fine-Tune Your PC for free

We found 50 programs that will make your PC fast, reliable, and secure—and won't cost you a dime.

BY RICK BROIDA

To tweak the old saying, the best things in life are freeware. If you've chatted online using ICQ, protected your PC with ZoneAlarm, or listened to MP3 tunes with Winamp, you've already sampled some of the best software money can't buy. But there's a lot more where that came from, and it can all be yours for the price of a download.

What's the catch? Amazingly, there isn't one. Freeware has existed since the early days of computing, the by-product of generous companies and individuals. Some of it comes from businesses hoping to spark sales of more lucrative products, as in the case of antivirus-software specialist Grisoft *(www.grisoft.com)*, which gives away a version of its AVG 6.0 Anti-Virus System, but sells a professional version. Most freeware, however, comes from philanthropic programmers pleased to share the fruits of their labor. Says Thomas Reimann, author of the performance-tweaking utility Cacheman, "When creating Cacheman 1.0, I was so happy with the result, I wanted to share it with millions, not thousands."

While programs like ICQ and Sun Microsystems' StarOffice (the latter a full-blown office suite) enjoy a certain celebrity, most freeware is of a lesser-known variety that can be used to tweak, refine, and repair the computing experience. These are programs that sweep debris from your Windows Registry, speed up file downloads, and make your CD-RW drive more efficient. You'll find virus checkers and media players, to be sure, but also font viewers, browser enhancements, driver updates, and file compressors. In short, if you're looking for a way to fine-tune your PC, a free utility can probably do the job.

Where can you find these fabulous freebies? On the Web, of course. Our favorite places to troll for software include Jumbo *(www.jumbo.com)*, Download.com *(download.cnet.com)*, and ZDNet Downloads *(www.zdnet.com/downloads)*. (The latter two are owned by CNET Networks, *Computer Shopper's* parent company.) Virtually every piece of software we discuss here can be found at one of these archives, although we also provide product-specific URLs whenever applicable.

BROWSING AT LIGHT SPEED

Admit it: You spend a fair chunk of your day perusing the Web—looking for information, downloading files, closing those annoying pop-up advertisement windows. If that's the case, some of your best freeware finds are programs that enhance and accelerate the Web experience, from banishing the pop-ups to steering you to relevant sites.

Take Alexa *(www.alexa.com)*, an accessory for Internet Explorer. (It's already integrated into Netscape Navigator 4.0 and later.) When active, it provides a wealth of data about the site you're viewing: contact

ILLUSTRATION BY FRANCESCO SANTALUCIA

Downloading PC Tuning Tools
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information, site reviews and rankings, and links to related sites. Alexa also helps you shop, providing direct links to relevant product pages on Amazon.com, and price comparisons courtesy of mySimon (also owned by CNET Networks, *Computer Shopper's* parent company). Alexa Toolbar takes no more than a minute to download, and integrates automatically into Internet Explorer, no installation required.

It's a tough call between Alexa and another browser-integrated tool, Girafa ***(www.girafa.com)***, which provides visual snapshots of pages you've searched for or visited. Suppose, for instance, you're looking for a chocolate-mousse recipe that includes photos. When you run a search using Girafa, the resulting pages are displayed as thumbnails, letting you see which pages have pictures before you visit them.

SurfSaver ***(www.asksam.com)*** aims to save you lots of time by providing a searchable, categorical filing cabinet for Web pages you've viewed. The idea is to help you quickly and easily find information from past Web searches without having to retrace your steps.

If your search turned up a file you'd like to download, you might be in for a long wait, even with a broadband connection. Programs such as Download Accelerator Plus ***(www.speedbit.com)*** and GoZilla Free ***(www.gozilla.com)*** promise to speed up file transfers, regardless of your connection speed. They work this magic by downloading a given file from the fastest available public archive, which may not necessarily be the site you're on. What's more, they resume interrupted downloads, so you're not forced to start over in the event of a broken connection. These programs also serve as download managers, allowing you to queue multiple files for downloading at times when you're not using your PC, such as during the night.

NetSonic ***(www.netsonic.com)*** is another type of accelerator, but not just for downloads. Rather, it puts the spurs to your browser, caching and preloading previously visited pages so they appear to load much faster. NetSonic also supports offline browsing, and comes with the Maximum Transfer Unit (MTU) Optimizer, which ensures the fastest possible modem performance.

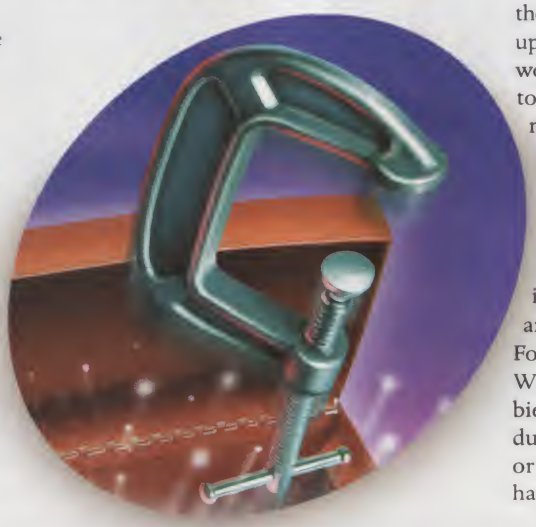
Now that you've sped things up, you may want to get rid of a few obstacles in your way. Advertising helps keep Web content free, but those little pop-up windows are more aggravating than junk e-mail. If you're tired of the interruptions, grab a copy of PopUp Killer ***(software.xfx.net)***.

FREE SOFTWARE FOR PC FINE-TUNING

True to its name, this handy little helper (which works not just with Internet Explorer and Netscape, but also browsers such as Opera and NetCaptor) eradicates pop-up windows before you see them, and can also quash the windows that sometimes appear when you close your browser.

THE PC SQUEEZE PLAY

No computer is complete without some form of file-compression software, utilities that shrink files to manageable sizes for transmission, and then expand them once they reach their destination. Most of the files mentioned in this story, for instance, are compressed for download in the ubiquitous ZIP format; you'll need software to decompress them once they're in your system. Compression is also a useful technique for sending files. Suppose you have a batch of digital photos you want to e-mail to friends and family. Instead of sending each one separately—an inconvenience, at best—compression software lets you combine them into a single archive.



WinZip ***(www.winzip.com)*** is the granddaddy of compression software. It supports a variety of compression formats and includes novice-friendly wizards. Of course, it's not technically freeware. Although you can download a full-featured evaluation version that never expires, the software does have a $29 price tag attached. If you use it, you should pay up.

You can compress and decompress guilt-free with PowerArchiver ***(www.ipsoft.cjb.net)***, a robust tool that supports ZIP, ARJ, CAB, and a host of other formats, as well as multiple-disk spanning, drag-and-drop archiving, and self-extracting archives. It also features an internal viewer that lets you peek inside compressed files without decompressing them.

The only format PowerArchiver doesn't handle is SIT, which prevails on the Macintosh platform. For that, check out StuffIt Expander ***(www.aladdinsys.com)***, available for Windows, Mac OS, and Linux. It supports SIT, ZIP, UUE, and many other popular modes of compression. The hitch is that it only decompresses files. For compression, you need the full version of StuffIt, available for $29.95.

MAKE A DATE TO UPDATE

Is your graphics card giving you trouble? Are you getting slammed by viruses even though you have antivirus software installed? Sounds like you need to update some files. Current drivers can solve compatibility problems with your system's hardware and software, while updated virus definitions will make sure that the newest infections don't strike your PC. While we obviously can't cover every product that's out there, these few are representative of the updates you can find with a little detective work. Also, remember: Virus definitions need to be updated regularly, but just because a new driver exists doesn't mean you need it. If it ain't broke, don't fix it.

Iomega Zip, Jaz, or PocketZip drive owners will want to grab a copy of IomegaWare ***(www.iomega.com)***. Among other improvements, it adds support for USB and IEEE 1394 (FireWire) connections, FotoShow Digital Image Center, and Windows Me. Another good Iomega freebie is QuikSync 3, which automatically duplicates—to a network drive, hard drive, or removable media—files saved to your hard drive.

If you prefer CD-RWs to Zip disks, check whether your CD-RW drive came with a version of Roxio (formerly Adaptec) Easy CD Creator ***(www.roxio.com)***. Even if you purchased the software separately, you may want to check for updates, which include bug fixes, support for additional drives, and support for Windows Me.

For the user who's frequently plagued by Windows error messages and wants to decipher the cryptic numeric codes that accompany them, there's MS Windows Error Messages 2.2 ***(www.zdnet.com/downloads)***. This utility provides descriptive error-code explanations and even organizes them by Windows version.

If you really want to keep Windows

humming, Microsoft has just the software for you. The Windows 2000 Service Pack 2 *(www.microsoft.com/windows2000/downloads)* fixes various reliability, security, and setup bugs, while the Windows 98 System Update *(www.microsoft.com/windows98/downloads)* includes USB and networking patches.

Finally, older versions of McAfee.com VirusScan *(www.mcafee.com)* or Norton AntiVirus *(www.symantec.com)* may lack the auto-update features found in today's versions. Or maybe you've disabled auto-update for one reason or another. Either way, you should be sure to regularly download and install the latest virus definitions, which will help the software protect your PC from modern plagues.

LETTER-PERFECT

Everyone loves fonts, the fancy typefaces that make your business cards, newsletters, and Web pages look spiffy. Whether you're looking for font collections, font viewers, or font-tweaking utilities, you'll find plenty of choices online.

The more fonts you have installed, the harder it gets to remember what each one looks like. AkFontViewer *(www.aksoft.net)* lets you view samples of each font in its own typeface. Meracl FontMap *(home.swipnet.se/~w-54059)* works similarly, but also lets you drag and drop font characters into other applications. Perhaps the most robust font tool is The Font Thing *(members.ozemail.com.au/~scef/tft.html)*, which not only displays installed and uninstalled fonts, but also lets you add, remove, print, copy, delete, and group them.

If you're looking for fonts themselves, the Font Emporium *(www.fontemporium.com)* is home to dozens of TrueType fonts, all free for the asking. Rather than downloading them one at a time, look on Download.com for a file called All Fonts from the Font Emporium. It's a collection of more than 30 lively and inventive typefaces.

THE LOWDOWN ON DOWNLOADS

Most Web downloads transpire within the comfortable confines of your browser, but a browser isn't always enough. To upload a file to a company server, for instance, you need an FTP program. If your downloads are frequently interrupted because of spotty connections or flaky servers, a download manager lets you resume disrupted downloads.

For fast transfers, look no further than LeechFTP *(stud.fh-heilbronn.de/~jdebis/leechftp/downloads.html)* and SmartFTP *(www.smartftp.com)*, two admirably robust programs. At press time, LeechFTP was no longer being supported by its creator (its successor, BitBeamer, is still in beta), but you can still download and use the program. SmartFTP employs a familiar Explorer-type interface that supports drag-and-drop file transfers, multiple FTP connections, and FTP search engines. It also resumes broken downloads, and it even has a Favorites list.

If you're a download fiend (and you will be, if you obtain even half the programs highlighted in these pages) it makes sense to use a program that organizes your downloads and helps you complete them. We already mentioned GoZilla Free, a download manager that can also improve file-transfer speed. We're also partial to GetRight *(www.getright.com)*, which lets you pause and resume downloads, schedule downloads, and even shut down your PC when the downloads are done.

FREE SOFTWARE FOR PC FINE-TUNING

LOOK AND LISTEN

Music has already conquered the Web, and video is next in line. The question is, what's the best way to look and listen? There's no shortage of media players that let you do everything from organizing and playing MP3 music to watching live streaming video. Not all of the content is free, but the players certainly are.

For the MP3 fan, it's hard to beat Winamp *(www.winamp.com)*, one of the oldest music players around and still one of the most popular software selections at Download.com. Although it only plays MP3 files (meaning no ripping of files from CDs), Winamp ranks as a perennial favorite thanks to its use of skins (colorful faceplates that change the look and feel of the player) and visualizations, trippy animations that undulate to your tune. There are thousands of both, ranging from skin themes based on Pizza Hut and *The Simpsons* to visualizations with dancing girls. Winamp also supports a vast library of plug-ins that provide special effects and other functions.

Like Winamp on steroids, Sonique *(sonique.lycos.com)* adds a playlist editor, support for music-file formats including CD-Audio and WMA, and the option to listen to

Handouts For Your Handheld

Freeware doesn't end with Windows. You can find plenty of great stuff for your handheld PC too, be it a Palm OS device or a Pocket PC. Start with AvantGo *(www.avantgo.com)*, a miniature Web browser that downloads content channels (news, sports, stocks, weather, and much more) each time you synchronize your handheld. It's available for both platforms.

Pocket PC users should check out PocketTV *(www.pockettv.com)*, which, unlike Microsoft's own Windows Media Player, lets you play standard MPEG files, complete with sound. Then head to PocketMovies.net *(www.pocketmovies.net)* for movie trailers, animated and live-action shorts, and other cool content. Finally, don't forget Microsoft's PowerToys *(www.pocketpc.com)*, a collection of tweaks and enhancements for the operating system and applications.

Palm users interested in e-books can download the Palm Reader from Palm Digital Media/Peanutpress.com *(www.peanutpress.com)*. It's a viewer for both commercial titles and a vast collection of public-domain works. A versatile image viewer, Album To Go *(www.clubphoto.com)* lets you view, beam, and organize photo collections. For the game fan, Vexed *(www.spacetube.tsx.org)* provides addictive brain-bending puzzles, and Patience *(www.keithp.com/pilot)* serves up a whopping 15 solitaire games. For better management of this and all your other software, Launcher III *(www.benc.hr)* organizes applications into tabbed windows and offers drag-and-drop beaming.

ILLUSTRATION BY FRANCESCO SANTALUCIA

streaming audio. If you want to go beyond mere listening, check out Jet-Audio *(www.cowon.com)* and Musicmatch Jukebox Basic *(www.musicmatch.com)*, which allow you to covert CD-Audio tracks to MP3 files and burn your MP3s onto CDs.

If you like to look as well as listen, you may want to check out DivX video, a technology based on the MPEG-4 compression format that packs high-quality video into very small files. The Global DivX Player *(www.gdivx.com)* plays not only the eponymous format, but also AVI, MPEG, and other formats, and uses far fewer system resources than Windows Media Player, according to its developer.

Windows Media Player 7.1 is a powerful tool, however, and if you're running Windows Me or another current iteration of Windows, chances are it's already installed. If not, fetch this versatile player directly from Microsoft *(www.windowsmedia.com/download)*. The big deal about WMP is that it plays music, video, Internet radio, and more, all under one software roof. It also lets you create music CDs and transfer songs and playlists to portable devices, including MP3 players.

Microsoft's biggest challenger in this arena is RealNetworks' RealPlayer 8 Basic *(www.real.com)*, a streaming audio/video player that serves up a wealth of content channels. Of course, there's no reason you can't use both.

TWEAKING THE NIGHT AWAY

If you're not afraid to fiddle with Windows' settings, or you actually enjoy it, you can deploy some handy freeware to create a faster, safer, more reliable system. For instance, every PC needs virus protection, and Antidote Super Lite *(www.vintage-solutions.com)* gets the job done.

Want to protect yourself from prying eyes? Eraser *(www.tolvanen.com/eraser)* helps ensure that deleted files stay that way. If you tend to store sensitive information on your PC, this utility can erase files permanently. It features drag-and-drop functionality and can be easily integrated into Explorer.

A few minor adjustments to the way your machine handles memory may boost overall system speed. Cacheman *(www.outertech.com)*, MemMax *(t-rod.rsn.hk-r.se/tiberius)*, and RAM Idle *(www.download.com)* give you control over cache and memory settings, all in the interest of eking out faster performance.

FREE SOFTWARE FOR PC FINE-TUNING

Fast computers deserve fast online access, and that's where EasyMTU *(www.members.tripod.com/~easymtu)* comes in. It modifies the settings for your dial-up modem to optimize your Internet connection. And if you're interested in diagnosing problems with the connection itself, MyVitalAgent *(www.myvitalagent.com)* employs a slick digital dashboard to display network activity related to Web browsers, e-mail clients, FTP programs, and more.

Finally, Xteq X-Setup *(www.xteq.com)* may be the ultimate tool for tweakers. Use the application to adjust some 750 Windows settings, from Explorer's appearance to security options. It even provides handholding wizards for would-be Windows mechanics.

BEEFING UP SECURITY

Just because you have nothing to hide doesn't mean you should reveal your PC and online activities to the world. A little paranoia is not without merit when it comes to protecting yourself and your PC, hence the abundance of privacy and system-security software.

Lavasoft's Ad-aware *(www.lavasoftusa.com)* scans your computer's memory, drives, and Registry for so-called "spyware" modules (essentially, cookies that track your online activities and transmit a log back to advertisers) and removes them. Take note, however, that removing these modules can cripple the programs, such as Alexa and NetSonic, that put them there.

Spyware may well lead to more junk e-mail. Spam doesn't really threaten your privacy, but it's definitely one of the Internet's biggest annoyances. True to its name, Spam Buster *(www.contactplus.com)* removes junk e-mail before it reaches your in-box, filtering messages that come from 15,000 known spam sources.

Spam is bad, but hackers are worse. And broadband Internet connections are especially susceptible to hackers, which is why no cable- or DSL-powered PC should be without Sygate Personal Firewall *(www.sygate.com)* or ZoneAlarm *(www.zonelabs.com)*. These surprisingly robust utilities make your machine effectively invisible to the outside world, while at the same time blocking unauthorized PC programs from accessing the Net.

As we learned from Tom Cruise in *Mission: Impossible*, hackers don't always access your machine over the Internet; some access your computer directly. SecureIt Pro *(www.go.to/quantrix)* is a system-tray utility that password-protects your machine, disables reboot keys, and provides cold-boot security. It supports key-disk access, logs access attempts, and even allows visitors to leave you messages.

FREE FOR ALL

There may be no such thing as a free lunch, but at least that rule doesn't apply to software. With just a few of the programs mentioned here, you can accelerate, optimize, and protect your PC, to say nothing of turning it into an entertainment center.

But do the right thing: If you use a freeware program, send the creators a note of appreciation. If you happen to live nearby, you might even consider taking them out for a free lunch. ▼

Everything You Need To Run a PC—Free

It's easy to find sweet deals on discontinued, second-hand, and refurbished PCs. But those deals can sour in a hurry if you wind up spending hundreds of dollars on software. Fear not: You can outfit a Windows-based machine from top to bottom without spending a penny.

Start with StarOffice *(www.sun.com)*, a comprehensive office suite that can import and export Microsoft Office files. Next, you'll want to install an antivirus program. Check out the previously mentioned Antidote Super Lite *(www.vintage-solutions.com)*, as well as AVG 6.0 Anti-Virus System *(www.grisoft.com)*. Both programs offer some of the desirable features of their commercial counterparts.

Everyone needs a good PIM, and Contact Plus Personal *(www.contactplus.com)* provides scheduling, contact management, to-do lists, and more.

For money management, check out PandaMoney 3.0 *(www.auspic.com)*, which lets you handle up to five user accounts and 10 bank accounts. Want to receive faxes on your PC? Look no further than eFax Free *(www.efax.com)*, which assigns you a fax number and delivers documents to you via e-mail.

For the fun side of free software, we recommend looking into the popular ICQ *(web.icq.com)* for online chats, Windows Media Player 7.1 *(www.windowsmedia.com/download)* for music and video, and Macromedia's Shockmachine *(www.shockwave.com)* for a slew of free games, music, greetings, and more.

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B7ACUSL2C.....$114.95
Gigabyte GA-7DX Socket A, motherboard, 5 PCI
B7G7DX.....$169.99

CPU

AMD Duron Socket A, retail.

IP7AD750R.....750MHz
IP7AD850R.....850MHz
IP7AD900R.....900MHz

AMD Athlon T-Bird Socket A, retail.
IP7AT12R.....1.2GHz
IP7AT13R.....1.3GHz
IP7ATB1R2.....266MHz.....1GHz
IP7ATB12R2.....266MHz.....1.2GHz

Intel Pentium 4, DDR, retail.
IP4I14.....1.4GHz
IP4I15.....1.5GHz
IP7I17.....1.7GHz

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ONLINE GAMING SITES

Get Your Game On(line)

Dan Harmon doesn't like the moniker "addict" applied to those who share his passion for EverQuest. "I think people who blame the game for divorces and broken relationships are using [it] to excuse a character flaw, not a mental flaw," says Harmon, 41, an unmarried LAN administrator.

Despite Harmon's assertions, EverQuest, and other online multiplayer games like it, have been named as the cause of more than one divorce. The online role-playing adventure has attracted hundreds of thousands of players, some getting so drawn in that jobs and relationships become real-world casualties. Harmon, who says he isn't *that* hooked, admits to playing two hours each night and eight

Whether you're into playing checkers or shooting zombies, great games await you on the Web.

BY RICK BROIDA

hours each day on weekends, which may help explain the game's nickname, "Evercrack."

Is online gaming really that much fun? It can be, though it's rarely so addictive. Most Internet entertainment is relatively innocuous, from friendly games of checkers and chess to nostalgic recreations of Centipede and Ms. Pac-Man. With just a dial-up Internet connection and a Web browser, you can play almost any game online, be it blackjack, Jeopardy, golf, or slot machines. And you can play against real people.

NAME YOUR GAME

We poked our heads in the virtual doors of dozens of popular gaming sites to uncover 10 we considered the best. (See the table, "The Goods on the Gaming Sites," to find the sites that offer the games you want.)

If you're looking for traditional games, visit Pogo.com ***(www.pogo.com)*** and Uproar.com ***(www.uproar.com)***, where you'll find browser-based diversions that are played exclusively online and run via a Java or Shockwave applet you download when you launch the game. These include traditional games that aren't under copyright, such as dominoes, video poker, checkers, chess, and card games.

Other sites, such as GameSpy ***(www.gamespy.com)*** and Kali ***(www.kali.net)***, offer software that makes it easier to find online opponents for multiplayer retail games. These include titles such as EverQuest, Diablo II, Half-Life, Unreal Tournament, and Command & Conquer. Once you download the software, you run it from your PC to connect to the sites' servers, where you're matched with other players. But the sites offer more than just software; they've evolved into gaming communities with levels, patches, skins, and advice.

You'll also find worthwhile destinations such as MSN Gaming Zone ***(zone.msn.com)***, one of the Internet's most highly trafficked gaming portals and home to classics, retail games, and pay-to-play online-only titles.

Together, these sites encompass everything from cribbage at Yahoo Games ***(games.yahoo.com)*** to Knockout Kings Web Boxing at EA.com ***(www.ea.com)***. Some games are played solo, others with one or more online opponents (or teammates). Some have rudimentary graphics; others take full advantage of 3D-accelerated graphics cards. (See

PHOTO BY BILL MILNE

"Game Gear" for a more specific list of system requirements.)

Like Kali and GameSpy, many of these sites serve up more than just gaming. News, editorials, discussion forums, downloads, and chat rooms are among the more enticing offerings. You can learn about new games, read reviews, download patches or new levels, meet other players, launch a multiplayer game, or play a game directly at the site.

America Online subscribers can go to keyword "games" for a wealth of single-player and multiplayer diversions, all powered by EA.com. (Non-AOL members can

play the same games at the EA.com site.) Finally, even though Blizzard Entertainment's Battle.net *(www.battle.net)* supports only four games, it's still a great source for rankings, message boards, patches, and gameplay strategy for online favorites Diablo, Diablo II, StarCraft, and WarCraft.

If you're concerned your Internet connection may not be equal to the task, don't be. Although graphics-intensive games (such as Unreal Tournament) all but mandate a broadband connection, many online games work just fine with a dial-up modem. It may take a bit longer to fetch the Java applet or download the necessary system files, but you'll usually be up and playing in just a matter of minutes.

WHAT YOU'LL PAY TO PLAY

In the early days of online gaming, many services charged $10 to $20 per month for access. Today, some sites still make you pay to play (MSN Gaming Zone, for instance, charges $9.95 per month for the air-combat simulator Fighter Ace), but

The Goods on the Gaming Sites

Site	What You'll Find	Most Popular Game(s)	Other Choices	Special Features
Battle.net (*www.battle.net*)	Message boards, patches, and strategy for Blizzard Entertainment's retail games	Diablo, Diablo II, StarCraft, and WarCraft	None	Detailed technical support and abundant free downloads related to Blizzard's games
EA.com (*www.ea.com*, AOL keyword: games)	Dozens of sports and classic games	Poppit (Free), Air Warrior III (subscription)	Backgammon, Bunny Luv, It's Outta Here, Meteor Madness, NASCAR Web Racing, PoppaZoppa, Treasure Trivia	Matchmaking services and rankings for various retail games; message boards
GameSpy (*www.gamespy.com*)	Matchmaker software, plus a wealth of game-related information	Spades (free), Half-Life (retail)	Just about every retail game under the sun	Patches, forums, game news, hints, cheats, help
Kali (*www.kali.net*)	Matchmaker software	Half-Life	Age of Empires, Crimson Skies, Delta Force, No One Lives Forever, Road Rash, Unreal	Game news
MSN Gaming Zone (*zone.msn.com*)	Lots of free games, plus matchmaking services for popular retail titles	Bejeweled (free), Asheron's Call (retail)	Dozens of board, card, puzzle, and trivia games, plus most of Microsoft's retail games, and a few online-only titles	Access to many other popular MSN features, such as shopping and personal finance
Pogo.com (*www.pogo.com*)	Classic board and card games, plus casino, trivia, and word games	Ali Baba Slots	Bridge, Buckaroo Blackjack, Doomsday, 5 Alarm Trivia, Highland Golf	Prize tokens redeemable for entries into cash-prize contests
Shockwave (*www.shockwave.com*)	Classic single-player arcade games, and a wide variety of casino, board, puzzle, and sports games	Real Pool 3D	Centipede, Daily Jigsaw, DJ Fu: Wax Attack, Joust, King Putt Mini Golf	Game collections you can download and play offline
The Station (*www.station.sony.com*)	Multiplayer role-playing adventures and favorite TV game shows	EverQuest	Infantry, Jeopardy, Sovereign, Star Wars Galaxies, Trivial Pursuit, Wheel of Fortune	Instant messaging with other Station members
Uproar.com (*www.uproar.com*)	Point-based games that award money and prizes	Family Feud	Horse Racing, Mah Jong Solitaire, Name That Tune, Word Search	A boss-protection "panic" button that pops up a fake business report
Yahoo Games (*games.yahoo.com*)	Card, board, and fantasy-sports games	Chess	Bingo, Chinese Checkers, Cryptogram, Fantasy Baseball, Pinochle	PC- and console-game news

many great games cost nothing. Services such as Pogo.com and Uproar.com even dangle cash incentives to keep you playing. On Pogo.com, for example, winning games earns you "tokens" you can trade for entries in cash and prize drawings.

In most cases, the price you pay for online entertainment is a heavy dose of advertising, usually in the form of banners that appear before and during game sessions. Not a bad deal for games such as Shockwave's Real Pool 3D *(www.shockwave.com)*, a photo-realistic pool simulation that rivals many retail games we've seen, or many of the RealArcade

ONLINE GAMING SITES

offerings (***www.realarcade.com;*** the service was still in beta at this writing).

This exceptional free stuff is the exception, however; most of the freebies are rather light fare. EA.com charges $4.99 per month for its EA Sports Service, which lets you play head-to-head and multiplayer Web versions of sports games such as baseball, golf, and soccer. For $9.99 per month, EA Platinum adds more games, including NASCAR Web Racing and Air Warrior III.

If you want to play retail games that have online multiplayer versions, such as Diablo, Half-Life, and EverQuest, you'll have to pay for the game itself, and sometimes you'll have to pay extra for the online experience. EverQuest costs about $40 for the game and $10 per month to play.

Technology	Cost	Typical Patter and Promotions
Various	Free	"How do I get into the Brood War tournaments??"
Various	Free (EA Sports Service, $4.99 per month; EA Platinum Service, $9.99 per month)	"Yer out!"
Proprietary	Free ($20 one-time fee for registered version of GameSpy Arcade)	An interview with Angelina Jolie (as Lara Croft)
Proprietary	$20 one-time fee	"Where's my rocket launcher?"
Various	Free (fees for certain premium titles)	"Zestyyyyyyy!"
Java	Free	"Fita the kitten has no brain damage and is acting normal."
Shockwave	Free	"DJ Fu! Now with real mixing ability!"
Various	Free (fees for EverQuest)	"I shall smite thee with my axe, pagan."
Java	Free	"Win a RAV4 or $20,000 cash!"
Java	Free	"How old RU?"

THE RAUNCH FACTOR

Though you're sure to meet some great people in online gaming venues, you're also likely to encounter immature teens, sore losers, "ditchers" who quit before a game is over, and plenty of raunchy talk. You can avoid some of the Internet's yahoos by avoiding games that include real-time chat.

Parents should be particularly wary. During a seemingly innocuous game of JT's Blocks (a Tetris knock-off) on Yahoo Games, we noticed a shockingly hostile and profane stream of chat messages flowing just beneath the game window. Although Yahoo Games offers a profanity filter, that doesn't prevent shady characters from striking up chats for nefarious purposes. To keep the kids out of harm's way, steer them to safe havens such as Sports Illustrated *for Kids* ***(www.sikids.com)*** and Wicked4Kids ***(www.wicked4kids.com)***.

CLICK HERE TO PLAY

The real beauty of online gaming is that it's easy to get your feet wet. We recommend starting with a service such as MSN Gaming Zone or Pogo.com, where just a few clicks lead you to a great game of Bejeweled or Tank Hunter. As for that role-playing adventure game with the ominous nickname, be warned: There's a reason it sparked a newsletter called *EverQuest Widows.* ▼

Game Gear

Even if your PC's from—gasp!—the 20th century, you should have no trouble playing most modern games online. System requirements are slight, and only leading-edge titles such as Quake III Arena or Unreal Tournament demand a broadband connection. Here's an example of what you need to play a Java-based game and a retail game such as EverQuest.

Java-Based Game

- 75MHz Pentium processor
- 8MB RAM (32MB recommended)
- 256-color VGA display (16-bit SVGA recommended)
- 15MB hard drive space (55MB recommended)
- Sound card
- 14.4kbps connection (56kbps recommended)
- Windows 95 or later
- Web browser with Java support

EverQuest

- 200MHz Pentium processor (266MHz recommended)
- 64MB RAM (128MB recommended)
- Direct3D- or Glide-compliant graphics card with 8MB RAM
- 600MB hard drive space
- Sound card
- 28.8kbps connection
- Windows 95 or 98

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WebBuyer

Study Buddies

These sites have the tools you need for school at prices that will earn you extra credit.

BY KEVIN SAVETZ

There's one thing you should learn before you hit the hallowed halls of higher education: Preparing for college means more than stocking up on Jolt cola and Cheetos. With that in mind, we've rounded up sites that offer great deals on back-to-school essentials.

Even in the Internet age, good old textbooks are still a key (not to mention expensive) part of any college education. Whether your curriculum includes quantum physics, Shakespearean sonnets, or the analysis of Beatles lyrics, you'll need a stack of books. Fortunately, online bookstores provide an alternative to pricey, overcrowded campus bookstores. **VarsityBooks.com *(www.varsitybooks.com)*** offers discounts on new textbooks, giving you the opportunity to shave a few dollars off the college store's bloated prices.

If you'd rather forgo tomes with crisp, unturned pages for extra beer money (we would), save big bucks by buying used books. Check out **BigWords.com *(www.bigwords.com)***, a handy price-comparison tool that scours the Web for the best prices on used textbooks. Search by title, author, or ISBN, but remember to order well before classes begin; depending on the seller, shipping can take a week or more. And after you've lugged those volumes around all semester, BigWords.com will show you the sites that will buy your books back *and* offer you the most money. You could also try **BooksIntoCash.com *(www.booksintocash.com)***, where you'll get free shipping and instant-cash offers with same-day payment in exchange for used books.

Covering your books is a first-week-of-school tradition that probably dates back to the days when your great-grandparents walked to school 10 miles uphill in the snow. **Book-Ease *(www.book-ease.com)*** offers a fun and easy alternative to all that measuring, cutting, and taping that comes with brown-bag book covers. The site sells stretchable, reusable cloth book jackets in expressive colors and prints. A screaming chartreuse or psychedelic "multipaisley" cover will at least help keep you awake for the duration of a three-hour ethics lecture.

Score the ever-important inflatable couch—along with other essentials—at StudentMarket.com.

While you'll still probably spend most of your study time hitting the books, software is increasingly becoming an essential learning tool. Luckily, a number of online stores offer students and faculty members deep academic discounts. **Journey Ed.com *(www.journeyed.com)***, **Micro Master Software *(www.micromasteronline.com)***, **SmartSoft *(www.studentdiscounts.com)***, and **CCV Software *(www.ccvsoftware.com)*** all promise significant student discounts on software from major publishers. At press time, the best price we found for Adobe Photoshop 6.0 was 60 percent lower than Amazon.com's price. But don't try pulling a fast one if you're not actually enrolled, because all these sites require proof that you are indeed a student.

And don't forget to stockpile school supplies such as shiny new binders, pens, pencils, and notebook paper. Online office-supply stores including **OfficeDepot *(www.officedepot.com)***, **OfficeMax.com *(www.officemax.com)***, and **Staples.com *(www.staples.com)*** traditionally extend special deals to students in the fall. But remember to check out smaller sites like **Office.com *(www.office.com)*** and **CheapOfficeSupplies.com *(www.cheapofficesupplies.com)***, where you can also find exceptional bargains.

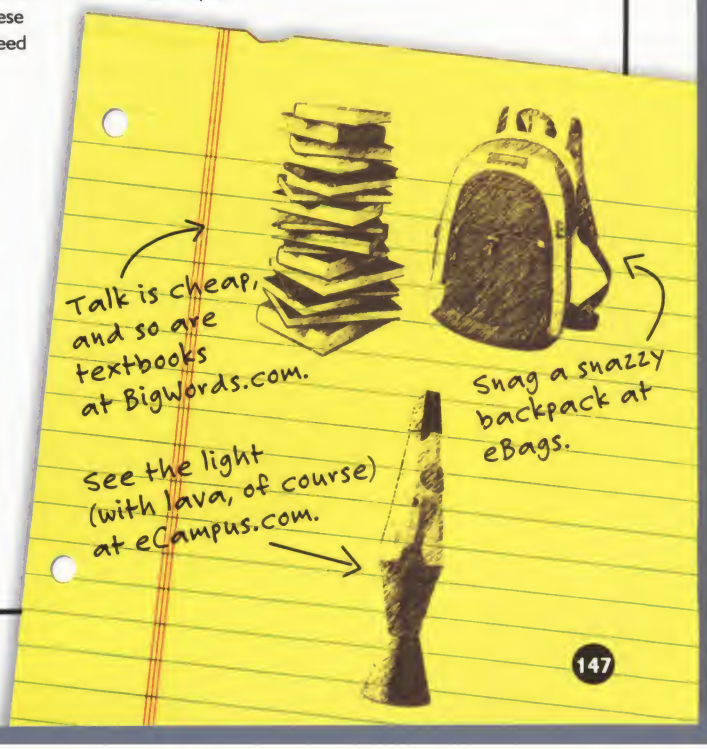
How will you lug all this stuff while sprinting a mile across campus to make that 8 a.m. class? Easy: **eBags *(www.ebags.com)*** boasts a bounty of book bags and backpacks. Browse by type, like leather-bottom or cool urban-style bags, or by price. You'll also find cases for your laptop computer. The site's case finder will help uncover a carrier that's just the right size for your portable PC.

If you're looking for a fun way to carry your lunch, remember that you don't have to be in grade school to appreciate a good lunchbox. **LunchboxShop.com *(www.lunchboxshop.com)*** serves up dozens of metal and plastic styles for grown-up students. If you're feeling retro and have extra cash, check the site's catalog of vintage lunchboxes. Choose among the likes of E.T. and Buck Rogers for a fun lunch date for the semester.

Dorm life might not be complete without **eCampus.com *(www.ecampus.com)***, a site offering dorm-room essentials like posters, lava lamps, and other furnishings. **Student Market.com's *(www.studentmarket.com)*** diverse selection includes art supplies, test-preparation software, and trendy inflatable furniture. (How could you possibly make it through four-plus years without a plastic blow-up couch?)

If you plan on goofing off all semester, there's no need to panic when exam time rolls around. Sharpen your number two pencils and point your browser to **Cram Info Online *(www.cram.com)***, a site that promises last-minute assistance for even the worst of procrastinators. You'll find course exams from actual universities for sale, along with downloadable cram notes for a variety of popular college courses and more than 300 laminated cheat sheets on topics ranging from foreign languages to chemistry. After all, you never know when a pocket-size periodic table will come in handy.

Have you been paying attention? There *will* be a quiz. ▼



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Dell™ Dimension™ 8100 Desktops Feature the Intel® Pentium® 4 Processor

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- 56K Capable[6] PCI Telephony Modem
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Limited Warranty[2] ■ 1-Yr At-Home Service[4]
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$1799 or as low as **$54** per mo. 45 mos.[12]

No payments for 90 days.[12] E-VALUE Code: 05028-500817a

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- Intel® Pentium® 4 Processor at 1.3GHz
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- 40GB[5] Ultra ATA/100 Hard Drive (7200 RPM)
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- 32MB NVIDIA® GeForce2 MX 4X AGP Graphics Card with TV-Out
- 8X/4X/32X CD-RW Drive
- Turtle Beach® Santa Cruz™ DSP Sound Card
- Harman Kardon® HK-195 Speakers
- 56K Capable[6] PCI Telephony Modem
- MS® Works Suite 2001 ■ MS® Windows® Me
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$1299 or as low as **$39** per mo. 45 mos.[12]

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- Intel® Pentium® III Processor at 1.0GHz
- 128MB Shared SDRAM[39] at 100MHz
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- 48X Max CD-ROM Drive
- Sound Blaster® 64V PCI LC Sound Card
- Harman Kardon® HK-195 Speakers
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- 1-Yr Limited Warranty[2]
- 1-Yr At-Home Service[4]
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$799 or as low as **$24** per mo. 45 mos.[12]

No payments for 90 days.[12] E-VALUE Code: 05028-500807

DELL™ NOTEBOOKS:

DELL™ INSPIRON™ 4000

Thin and Light

- Intel® Celeron™ Processor at 800MHz
- 14.1" XGA TFT Display
- 128MB 100MHz SDRAM
- 10GB[5] Ultra ATA Hard Drive
- Modular 24X Max CD-ROM Drive
- 8MB ATI® Rage Mobility™ 128 3D® 2X AGP Video
- Internal 56K Capable[6] FaxModem
- 59WHr Li-Ion Battery w/ExpressCharge™ Technology
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Limited Warranty[2] ■ 1-Yr Mail-in Service
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$1279 or as low as **$38** per mo. 45 mos.[12]

No payments for 90 days.[12] E-VALUE Code: 05028-800812

DELL™ INSPIRON™ 4000

Thin and Light

- Intel® Pentium® III Processor at 800MHz Featuring Intel® SpeedStep™ Technology
- 14.1" Super XGA+ TFT Display
- 192MB 100MHz SDRAM
- 10GB[5] Ultra ATA Hard Drive
- Fixed 8X Max DVD-ROM Drive
- 8MB ATI® Rage Mobility™ 128 3D® 2X AGP Video
- Internal 56K Capable[6] FaxModem
- 59WHr Li-Ion Battery w/ExpressCharge™ Technology
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Limited Warranty[2] ■ 1-Yr Mail-in Service
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$1679 or as low as **$50** per mo. 45 mos.[12]

No payments for 90 days.[12] E-VALUE Code: 05028-800816

DELL™ INSPIRON™ 8000

Multimedia Mobile Desktop

- Intel® Pentium® III Processor at 1.0GHz
- 14.1" Super XGA+ TFT Display
- 192MB 100MHz SDRAM
- 20GB[5] Ultra ATA Hard Drive
- Fixed 8X Max DVD-ROM Drive
- 16MB ATI® Rage Mobility™-M4 3D® 4X AGP Video
- Internal 56K Capable[6] FaxModem
- 59WHr Li-Ion Battery
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Limited Warranty[2] ■ 1-Yr Mail-in Service
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$2049 or as low as **$61** per mo. 45 mos.[12]

No payments for 90 days.[12] E-VALUE Code: 05028-800820

DELL™ INSPIRON™ 8000

Multimedia Mobile Desktop

- Intel® Pentium® III Processor at 1.0GHz
- 15" Ultra XGA TFT Display
- 256MB 100MHz SDRAM
- 20GB[5] Ultra ATA Hard Drive
- Fixed 8X Max DVD-ROM Drive
- 32MB DDR NVIDIA® GeForce2 Go™ 4X AGP Video
- Internal 56K Capable[6] FaxModem
- 59WHr Li-Ion Battery w/ExpressCharge™ Technology
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Limited Warranty[2] ■ 1-Yr Mail-in Service
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$2599 or as low as **$78** per mo. 45 mos.[12]

No payments for 90 days.[12] E-VALUE Code: 05028-800825

DELL™ SOLUTIONS:

SOFTWARE & ACCESSORIES

Printers:

- Epson® Stylus 777 Color Printer, add $89
- HP® DeskJet® 960Cse, add $149 after $50 HP® Mail-in Rebate[38] (Reg. $199)

Scanner:

- HP® ScanJet® 4400Cse, add $99 after $50 HP® Mail-in Rebate[38] (Reg. $149)

Power Protection:

- APC® Pro8T2 SurgeArrest, add $39

Software:

- Extreme Game Pack (Dimension™ only), add $79
- Family Game Pack, add $79

SERVICE & SUPPORT

How about some peace of mind to accompany your new Dell™ system?

Dimension™ Desktop Service Upgrades:

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Inspiron™ Notebook Service Upgrades:

- Upgrade Inspiron™ Notebooks with 1-Yr Ltd Warranty[2] and 1-Yr Mail-in Service to:
  - 3-Yr Ltd Warranty[2], 3-Yr Mail-in Service and 24x7 Lifetime Phone Support, add $99
  - 3-Yr Ltd Warranty[2], 3-Yr Next-Business-Day On-Site Service[4] and 24x7 Lifetime Phone Support, add $219

[10]Telephone access (call your phone co. for details) and other surcharges for access may apply. Must register within 30 days of invoice and accept DellNet/MSN Terms of Service. You agree to be billed monthly fees after the initial service period. You may cancel service at any time. Offer valid for new customers only in U.S. households and must be over 18 years old with major credit card. Limited time offer. **[12]Monthly payment based on 13.99% APR FOR QUALIFIED CUSTOMERS. OFFER VARIES BY CREDITWORTHINESS OF CUSTOMER AS DETERMINED BY LENDER. Under 90 Days Same-As-Cash feature, interest accrues during first 90 days if balance not paid within 90 days. Customers not eligible for 90 Days Same-As-Cash feature may be offered standard 48-month financing with APRs ranging from 16.99% to 26.99%. Example: $1,650 purchase price, at 19.99%, 48 monthly payments at $51. Taxes and shipping charges extra and vary. From American Investment Bank, N.A. or CIT OnLine Bank to U.S. residents with approved credit.** Prices, specifications, availability and terms of offers may change without notice. Taxes and shipping charges extra, and may vary. Valid for U.S. Dell Home Systems Company new purchases only. [1]For a copy of our Guarantees or Limited Warranties, write Dell USA L.P., Attn: Warranties, One Dell Way, Round Rock, Texas 78682. [4]At-Home or On-Site service provided via third-party contract with customer. Technician will be dispatched, if necessary, following phone-based troubleshooting. To receive Next-Business-Day service, Dell must notify the service provider before 5 pm (customer's time). Availability varies. Other conditions apply. [5]For hard drives, GB means 1 billion bytes; accessible capacity varies with operating environment. [6]Download speeds limited to 53Kbps. Upload speeds are less (about 30Kbps) and vary by modem manufacturer and line conditions. Analog phone line and compatible server required. [38]For rebate details and coupons, call 800-728-9665 for HP. System and monitor purchase may be required for rebate. [39]Up to 11MB of system memory may be used to support integrated graphics. Intel, Intel Inside, Pentium, Celeron and Intel SpeedStep are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. MS, Microsoft, MSN and Windows are registered trademarks of Microsoft Corporation. HP and DeskJet are registered trademarks of Hewlett-Packard Corporation. Dell cannot be held responsible for errors in typography or photography. ©2001 Dell Computer Corporation. All rights reserved.

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- Dual Channel Ultra 160 SCSI
- 10/100 Lan Connector
- Optional RAID
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SITE REVIEWS FOR ONLINE SHOPPING

BY KEVIN SAVETZ

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<Tech Shopping

aberdeeninc.com

Targeting the savvy consumer who craves speeds and feeds, **Aberdeen** offers extensive specs on a wide variety of computers and accessories. Shoppers can see side-by-side comparisons of motherboards the company carries.

accessmicro.com

Need a gift for that special someone who has everything? Check out **Access Micro,** which stocks tons of items ranging from T1 routers to complete desktop systems. The help desk and hardware guide provide aid to first-time visitors, and the clearance area offers returned items and old inventory for below wholesale cost.

www.applied-computer.com

Selling PCs and supplies since 1984, **Applied Computer** promises to beat any advertised price. The company features an 80,000-product inventory; check the site's list of the 1,000 most popular ones. But beware of the handling fee tacked onto orders under $200.

blackbox.com

Get connected! Specializing in network products, **Black Box's** extensive 900-page catalog of storage, cabling, and surge-protection products—plus other connectivity accessories—can be viewed online or off.

buy.com

This monstrous, multifaceted site sells computers, electronics, books, movies, and more. With a whopping 850,000 items, **Buy.com** offers a price-matching policy on most of them.

cablestogo.com

Cables To Go sells every conceivable cable you might need for your PC, from standard SCSI to esoteric system-specific cables. You'll also find networking products, bulk cable, tools, and test equipment. You might even get lucky and snatch up what you need at a bargain price in the site's closeout section.

www.cd-recordable.com

The U.S-owned and -based **CD-Recordable Factory Store** actually manufactures the discs it sells. This easy-to-navigate site stocks a massive variety of CD-R discs, including colorless and tinted media, plus disc-packaging and -storage accessories.

cdw.com

CDW offers an enormous array of hardware and software for business. Create side-by-side comparisons in many product categories, and search out dollar-saving deals on the rebates-and-coupons page.

compgeeks.com

Revenge of the nerds, indeed! Shop the **Computer Geeks Discount Outlet** for new, discontinued, and refurbished computer gear. It's a trove for the do-it-yourselfer piecing together a desktop system. The site features low prices and complete specs on every product.

compuplus.com

Comp-U-Plus offers free technical support and a 30-day money-back guarantee on all the peripherals it sells. The catalog isn't exactly earth-shattering in scope, but the prices are reasonable, and plenty of name brands are represented.

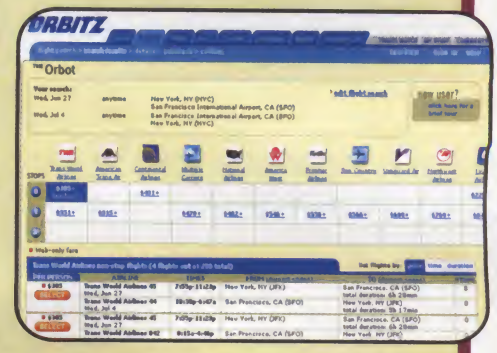
SEPTEMBER

COMPUTER SHOPPER site OF THE month

orbitz.com

Savvy travelers have been buying airline tickets online for years using self-service travel sites like Expedia and Travelocity.com. It was only a matter of time before the airlines figured out how to cut out the middleman and take advantage of the Web themselves.

Orbitz is the brainchild of five airlines (American, Continental, Delta, Northwest, and United), but it's not limited to those; the site sells tickets for more than 450 carriers. Navigation and ease of use are average as far as travel sites go, but the most notable advantage is price. In our tests, Orbitz airfare prices were almost always less expensive than the prices on other travel sites. The site also takes advantage of the latest fare-finding technology to offer more arrival, departure, and stopover options.



If you're craving a weekend getaway but don't care much where you go, use the Find Web Fares feature on the Deals page. Enter your departing airport, click "this weekend" or "next weekend," and the site will serve up a list of cheap fares to...wherever.

While the main attraction at Orbitz is the flight finder, you can also snag deals on hotel rooms, rental cars, cruises, or full travel packages.

SITE REVIEWS

compusa.com

The well-organized **CompUSA** rounds out the usual selection of PC hardware, peripherals, and accessories with areas devoted to electronics and gadgets. The frugal won't want to overlook the site's outlet section.

computergate.com

In business since 1991, **Computer Gate** promises a 30-day satisfaction return policy on its products, which include peripherals and build-to-order PCs. Check out the Quick Index: You'll never have to poke around for the right product again.

computers4sure.com

In the 19 well-stocked departments at **Computers4Sure.com** you'll find a broad spectrum of products including networking equipment, projectors, PDAs, scanners, and more. Bargain hunters can quickly sniff out deals on the Clearance pages.

computershopper.com

Computer Shopper's own piece of cyberspace, **computershopper.com,** provides access to product reviews, interactive guides to choosing a desktop or a notebook, and How to Buy sections for the most popular product categories. The site can also help you find an ISP, ASP, or Web host.

www.computersurplusoutlet.com

You're just crazy enough to build your own desktop system, aren't you? Then you'll feel right at home at **Computer Surplus Outlet,** where you'll find closeouts, overstocks, refurbished equipment, and liquidation items. You can even stumble upon the occasional assembly-required Pentium system for less than $100.

crucial.com

One of the largest providers of memory upgrades on the Web, **Crucial Technology** offers free shipping on RAM upgrades for 11,000 computer systems. The site's Memory Selector helps buyers find the right product, and the company backs its memory with a lifetime warranty.

cyberwarehouse.com

If you can't pass up a bargain-basement sale (and don't mind waiting a few days for your item to ship), **CyberWarehouse** is definitely for you. The site offers a small selection of PCs, monitors, and peripherals.

dalco.com

Dalco Electronics stocks everything from motherboards to monitors, ships them the day you order, and includes a 30-day guarantee. Bargain hunters will want to start with the specials found on the home page, which change regularly.

dartek.com

With a roster of more than 100,000 products, **Dartek** peddles an impressive selection of hardware, software, networking equipment, and office furniture. Well-designed features include printable spec sheets, customers' product ratings, a product-watch feature, and a frequent-buyers' club.

directron.com

Specializing in computer peripherals, **Directron.com** offers low prices on a wide variety of name-brand and OEM products. Most items include a 30-day guarantee, and any order earns you the right to pick through the Free Stuff bin. Savvy savers will appreciate the Clearance area, as well as frequent-customer and volume-purchasing discounts.

dirtcheapdrives.com

If you can store data on it, this site sells it. **Dirt Cheap Drives** offers hard drives, CD-ROM and DVD hardware, and drive arrays, with detailed technical information about each product. This decade-old company also stocks mounting kits, media, and accessories.

ebatts.com

Is your notebook or UPS battery running out of juice? **eBatts.com** specializes in batteries for laptops, uninterruptible power supplies, mobile phones, and camcorders. Check out the site's battery tips area for info about battery life, maximizing performance, and recycling old batteries.

ecost.com

The **eCost.com** catalog spans the full range of PC hardware and software, including ready-to-use systems, peripherals, accessories, and applications. The site features fastidious organization and personalized product recommendations.

egghead.com

Egghead.com shoppers can lose themselves in the site's hardware, software, office-product, and electronics superstores. Corporate users will find volume pricing, leasing information, and software licensing in the business center.

elinux.com

At **eLinux** you'll find a whopping 42,000 hardware and software products. The site is so serious about Linux, many of its desktop and notebook systems don't come bundled with that "other" OS. Special offerings include Linux news and a community forum.

emscomputing.com

EMS Computing offers a 40,000-product catalog, an easy-to-navigate site, and low shipping charges. A monthly newsletter delivers informative tips on choosing and using computer accessories.

fwdepot.com

FireWire Depot serves up IEEE 1394 (FireWire) stuff for your compatible computer. The site's selection includes drives, cases, cables, and IEEE 1394 upgrade cards. The buyer's guide provides insightful answers to frequently asked fiery questions.

harddrive.com

Pack rat? **HardDrive.com** has your storage solution. Choosy shoppers will find extensive choices in IDE, SCSI, and IEEE 1394 (FireWire) drives, along with other peripherals. For fashion-forward computer users, the site offers an array of black PC components, from cases to scanners. After all, black *does* go with everything.

hypermicro.com

Hyper Microsystems specializes in storage. The catalog includes CD-ROM and CD-RW drives, tape backup drives, hard drives, and RAID adapters. Check the Hyper Bundles for ready-to-use RAID and CD-RW starter kits.

igo.com

iGo calls itself a "mobile technology outfitter." Use the site to outfit your cell phone, laptop, or PDA with chargers, batteries, and other necessary accessories. The iGo Alerts feature delivers free customized news to your portable device.

insight.com

With more than 110,000 items for sale, **Insight** offers an impressive catalog of hardware and software. Customized sites are available for shoppers in the United States, Canada, the United Kingdom, and Germany.

jandr.com

Hardware, software, home-office products, and appliances abound at **J&R Computer World,** the New York City-based superstore famed for its selection and, ahem, "brusque" service. Avoid the attitude with this online version, which specializes in cameras, both digital and traditional film models. Product help is available via e-mail, online chat, and *phone*.

SITE REVIEWS

lanblvd.com

Wrestling with your old router? Network card not working? **LanBlvd.com** specializes in networking products. You'll find hubs, routers, interface cards, and wireless stations, along with other essentials for your LAN.

laptoptravel.com

Laptop Travel is road-warrior heaven! The site sells portable-computing and international-travel gear, including electrical adapters, modem converters/couplers, and security accessories. You'll find traditional and "camouflaged" laptop carrying cases, laptop RAM, and storage add-ons.

linuxcentral.com

Find your alternative at **Linux Central.** The site stocks Linux-friendly hardware, commercial software, and operating-system CD-ROMs. A selection of Linux-compatible T-shirts, hats, and ties will help you flash your alternative tendencies in public.

mcglen.com

McGlen Micro's specialized searches can help you find memory and other accessories compatible with your computer, printer, or copier. With the Build-To-Order Configurator, shoppers can design a custom system, which the company will configure and ship to you in two days.

megahaus.com

MegaHaus bills itself the "drive authority," offering a wide variety of storage solutions, including hard drives, DVD drives, RAID arrays, and CD-mastering products.

mei-microcenter.com

MEI-Micro Center offers new and refurbished desktops from Compaq, eMachines, Hewlett-Packard, and PowerSpec. You'll also find a small selection of peripherals. Rummage through the bargain bin for deals on closeouts, refurbished units, and overstocks.

memman.com

All of the desktop and laptop memory sold at **Memory Man** carries a lifetime warranty, and the site's reference guide offers RAM-configuration info for all name-brand computers. The site also sells processors, motherboards, hard drives, heat sinks, and more for the intrepid system builder.

memory4less.com

Memory4Less.com offers low prices on a wide variety of RAM, including older types you may have been pulling your hair out to find. If you don't know the memory requirements of your computer or digital camera, this site will clue you in.

microx-press.com

MicroX-Press offers detailed information about most of the products it sells. The site will send you an e-mail whenever a product's price drops below a limit you set. Customers are invited to rate and review products they've tried.

www.mobile-mania.com

Quickly head to **Mobilemania.com** for digital cameras, e-mail devices, PDAs, cases, and adapters. You'll find the bountiful selection a haven for folks (like you) who are always on the go.

mobileplanet.com

MobilePlanet is home to a gaggle of high-tech tools and toys for mobile professionals. The selection includes handheld and notebook computers, PDAs, wireless-communication products, and travel-size printers and scanners.

mobilizenow.com

On the go? *Gear up at* **MobilizeNow,** where you'll find the gadgets you need, including GPS receivers, portable radios, and cellular and PDA accessories. Tell the site what country you're headed for, and it will spit out a list of appropriate adapter plugs, phone adapters, and voltage converters.

monitoroutlet.com

From inexpensive 14-inchers to elegant (and pricey) flat-panel LCDs, **Monitor Outlet** offers a wide range of displays. The site sells units from 24 manufacturers, with quick-comparison pages to help you choose. The catalog also includes specialty monitors such as touch screens, wide-aspect-ratio displays, and projectors.

Used and Refurbished Computer Components

baber.com

Looking for an inexpensive portable PC? Check out **Baber.com,** which sells used laptops for as little as $250. You may have to invest in a new battery, since used batteries for portables are not covered by the site's usual 30-day warranty.

electrified.com

Electrified Discounters offers a large inventory of refurbished, used, discontinued, and off-lease desktops, notebooks, and peripherals. Choices include Pentium III laptops, ancient 486s, even digital cameras and monitors. The site provides information about each product, but it can be difficult to navigate.

liquidationstation.com

Liquidation Station sells used and refurbished Macintosh and PC systems, printers, and monitors. You'll find complete specs on most items, and the site is forthcoming about imperfections such as scratches and bad batteries.

pcplanet.net

PC Planet delivers quality preowned laptops from major manufacturers. The selection is small, but you'll find plenty of information about each product, including technical specs and physical condition.

refurbdepot.com

The RefurbDepot.com offers refurbished computers, electronics, and office equipment from name-brand manufacturers. The site offers a good selection, and most products include a standard manufacturers' warranty.

usedcomputer.com

The Used Computer Mall sells refurbished PCs from IBM, Compaq, Dell, and other manufacturers. You can get the best deal by choosing a unit with cosmetic flaws. The selection also includes servers, PDAs, and monitors.

used-pcs.com

Used-PCs.com sells preowned desktops, notebooks, monitors, and accessories. Buy a CPU only, or a complete Internet-ready system for the computer novice in your life. The prices are low, but buyers can't be too picky: For instance, you can get a 15-inch monitor for $59, but you can't choose the brand or model.

ILLUSTRATIONS BY BILL RIESER

SITE REVIEWS

motherboardexpress.com

Oh, Mama. **Motherboard Express** was made for PC-building connoisseurs. Shoppers can filter the selection of 100-plus boards by manufacturer, chipset, processor type, case type, onboard controller, or number of CPUs.

motherboards.com

With a wide selection of motherboards from nine manufacturers, do-it-yourselfers will revel in handpicking the perfect innards for their new PCs at **Motherboards.com.** Order a motherboard and CPU together, and the company will configure and test them for you.

www.mwave.com

In addition to PC systems and peripherals, **Multiwave Direct** stocks notebook accessories, videoconferencing equipment, and network tools. Top sellers, "blowout specials," and rebate forms are a click away from the home page.

Printer Consumables and Accessories

inkcarts.com

Inkcarts.com offers inkjet and laser-printer cartridges, fax thermal ribbons, refill supplies, printer paper, and bulk ink. Searching by printer or OEM part number makes finding the right item a breeze. All products, including remanufactured and generic ink cartridges, are backed by a one-year guarantee.

inkjets.com

If your printer is putting you in the poorhouse, visit **Inkjets.com.** The site specializes in remanufactured and compatible inkjet cartridges that cost much less than name-brand ink. All cartridges include a one-year guarantee.

www.ledesktop.com

Le Desktop offers distinctive paper and envelopes that will jazz up your printer's output. The catalog includes attractive translucent, parchment, and high-gloss papers. In addition to a variety of recycled papers, you'll find unusual "tree alternative" papers made from banana peels, grass clippings, blue jeans, and seaweed.

123inkjets.com

123Inkjets specializes in generic and remanufactured inkjet cartridges. You'll also find laser toner, thermal-transfer ribbons, and paper. The Inkmail service allows you to have your inkjet cartridges professionally refilled, tested, and returned to you.

photoinkjet.com

Photoinkjet.com is a great place for fine-art inkjet papers and archival inks for the production of desktop art, photography, and large-format digital printing. The selection of archival ink is limited to Epson printers, but the professional papers will work with any brand of printer.

thirstyprinter.com

If you don't mind getting your fingers dirty to save some cash, check out **ThirstyPrinter.com.** The site sells inkjet refill kits—bottles of ink and syringes—that you can use to refill empty inkjet cartridges. You'll also find a healthy list of links to drivers for major and smaller printer manufacturers' models.

2for1inkjet.com

2 For 1 Inkjet offers two-for-one prices on toner and ink cartridges for virtually every brand of inkjet and laser printer, copier, and fax machine. But beware: Shipping can be slow, and there's no order-tracking.

webuyempties.com

Don't let your printer cartridges go to the landfill—sure they're small, but more than 200 million are thrown away annually. **We Buy Empties** pays $1 to $2 for certain depleted inkjet or laser-printer cartridges. Your old cartridges will be refilled, reused, and recycled.

neutronet.com

Neutron carries thousands of computer systems and peripherals from nearly 400 manufacturers and distributors. A handy toolbox offers easy access to best buys, help for first-time buyers, and a massive manufacturer directory.

newegg.com

You won't have to shell out big bucks or scramble for hardware at **NewEgg.com**. Peck at the site's listings of new products and top sellers, then take a crack at the specials. Order carefully—the 15 percent restocking fee might make you squawk.

www.notebooksuperstore.com

Devoted exclusively to portable computers, **NotebookSuperStore.com** sells more than 100 different laptop models from nine manufacturers. You'll see technical details about each model, and a comparison tool helps you zero in on the best portable for you.

nxgen.com

Next Generation's Web site is densely packed with prebuilt computers and peripherals ranging from cables to graphics cards. The selection is huge, and the site provides full specs and plenty of details about each product.

onvia.com

Onvia.com, a business-to-business computer outlet, offers a handful of features that distinguish it as a small-business resource, including a services marketplace, buying guides, and active community forums.

outpost.com

Outpost.com sells 170,000 products—a full range of computer hardware, plus cameras, electronics, and innovative specialty products from partner companies.

palmgear.com

Users of handhelds will appreciate the extensive selection of free and commercial programs downloadable from **PalmGear HQ.** Shoppers can buy PDA hardware and accessories, including carrying cases and hip styli. Sign up for an e-mailing list to receive information about new software, news, and user tips.

pcconnection.com

PC Connection offers nifty bargains on a colossal variety of PC and Macintosh products. Smart Selectors ease the searching process for shoppers looking for turnkey systems, cameras, printers, monitors, or memory to fit specific guidelines.

www.pcliquidator.com

The getting's good at **PC Liquidator,** a site that offers clearance, refurbished, and overstocked hardware and software. The inventory is always changing and usually inexpensive. You can find many hardware choices for under $10—some for less than $5.

SITE REVIEWS

PC Mall

pcmall.com

Shoppers at **PC Mall** receive free lifetime technical support on the site's vast selection of computers, hardware, and software. The site's business-solutions forum offers corporate leasing and volume pricing. Apple-heads can find all their favorite Macintosh products at the **Mac Mall** sister site ***(www.macmall.com)***.

pczone.com

PC Zone stocks an impressive selection of all things PC. You'll find links to a clearance area and other stores: **Mac Zone** and **Electronics Zone.** Printable rebate coupons can save you some cash.

provantage.com

Provantage offers PC products from more than 1,000 manufacturers, including a large selection of books and training materials. The site's Personal Tracking List feature lets customers build a list of product bookmarks, then monitor prices and availability.

7-24.com

Deal-crazy shoppers will feel at home at the **7-24 Outlet Store,** which sells computer hardware and electronics closeouts. This site is a source for hard-to-find media and accessories for SyQuest, Avatar, and Iomega Ditto drives. The electronics area offers telephones, walkie-talkies, and other gadgets.

www.sg3d.com

Sunway Graphics specializes in PC graphics cards, offering a wide selection of powerful 3D accelerators. You'll also see a smaller selection of other graphics products: TV-tuner cards, videoconferencing equipment, and video-capture cards.

shopper.cnet.com

The **CNET Shopper** search engine takes the guesswork out of finding a deal on hardware, software, and accessories. The price-drop-alerts feature will send you e-mail when the cost of a coveted gadget falls. (CNET Networks is *Computer Shopper's* parent company.)

sparco.com

Looking for that something extra? Check out **Sparco.com's** list of products that come bundled with "free stuff." The site stocks more than 130,000 products, and it offers a list of discounted items for students and faculty members of academic institutions.

ssdonline.com

At **State Street Direct,** shoppers will discover a huge selection of computers and imaging products. Digital-camera shoppers will find many items of interest, including customized comparison charts.

staples.com

Yeah, they've got that. **Staples'** Web site offers a liberal price-matching policy on computer accessories, software, and office supplies. If you order similar items often, you can set up personalized shopping lists. The company can occasionally take its time shipping items out to you, though, so beware.

tccomputers.com

In business since 1988, **TC Computers** sells fully configured systems, motherboards, and peripherals. The company's specialty is motherboards; buyers can choose to have motherboards and processors pre-assembled and tested for no extra charge.

tcwo.com

Thompson's Computer Warehouse Outlet offers only a small selection of computer products. You may find only a dozen monitors or four CD-ROM drives, but the prices are fantastic.

techstore.com

TechStore.com offers hardware in dozens of categories and highlights monthly top sellers. The site also sells software, ranging from productivity suites to children's titles.

thenerds.net

With no misgivings about the tech-savvy of its company or customers, **TheNerds.net** offers 60,000 computer products, ranging from cables and connectors to graphics cards, at its fast and friendly site. The liberal 30-day return policy will protect you from getting stuck with the wrong product.

tigerdirect.com

TigerDirect's site offers 40,000 products, including custom-built computers that are tested and shipped within 48 hours. Up for a little adventure? Order a build-it-yourself custom PC kit, and let the fun begin!

truedataonline.com

True Data Technology stocks an exceptional catalog of motherboards, hard drives, and other upgrades. The site also features communication essentials for businesses, including DSL equipment and telephony products.

usbstuff.com

USB Stuff specializes in Universal Serial Bus-equipped gadgets, including digital cameras, CD-RW drives, printers, modems, hubs, and input devices. But its poor site design makes navigation difficult. A sister site at ***www.firewirestuff.com*** stocks IEEE 1394-compatible hardware.

warehouse.com

The four "warehouses" under **MicroWarehouse's** roof sell PC hardware, Mac products, datacomm components, and supplies. The site accepts corporate, educational, and government accounts, and offers business leases on many products.

<Direct PC Vendors

www.alienware.com

Alienware won't abduct your pets, but the company can build you a high-end gaming machine, desktop video system, or high-performance workstation. Cases are available in a rainbow of out-of-this-world colors.

buyabs.com

Exceptional customer support on custom-configured desktop and notebook systems is the goal at **ABS Computer Technologies.** All systems include a 30-day money-back guarantee. Some computers are available with Linux preinstalled.

buy-atlas.com

Atlas Micro offers desktop PCs built around Pentium, Celeron, and AMD processors. Buyers can use drop-down menus to create a custom configuration and are protected by a reasonable 30-day return policy.

compaq.com

Three arms of **Compaq Computer's** site offer computers for everyone. See the Compaq AtHome division ***(athome.compaq.com)*** for home and home-office systems, DirectPlus ***(www.directplus.compaq.com)*** for business PCs and servers, or the Compaq Factory Outlet Superstore ***(compaqfactoryoutlet.com)*** for big bargains.

csd.toshiba.com

The Web home for **Toshiba's** stylish portables and desktop systems doesn't offer as many build-to-order options as some other sites, but it's loaded with plenty of extended-warranty and lease options.

cyberpowerinc.com

Each **CyberPower** PC includes a three-year warranty and 30-day money-back guarantee. The site's service area includes downloadable drivers and lifetime tech support.

dell.com

Dell Computer's electronic storefront has always led the way in ease of use. The site is jam-packed with detailed information that makes it a snap to match a machine to your needs. Each system is configurable to the nth degree via drop-down menus, and you can get quick access to online support customized for your PC.

SITE REVIEWS

www.fujitsu-pc.com

Fujitsu's site focuses on portable computing, including notebook PCs and pen-based tablet computers. Each computer includes several warranty options. A trade-in program offers cash back on your old computer when you upgrade to certain models.

gateway.com

One of the biggest players in online computer sales, **Gateway** has an enormous and informative site that sells custom-built desktops and portables, delivering them on time 98 percent of the time, according to BizRate.com.

hpshopping.com

At this site, **Hewlett-Packard** sells its lines of desktop and notebook computers, handhelds, PDAs, digital cameras, scanners, and printers. The site makes repeat purchases simple for businesses and individuals.

ibm.com/products

ShopIBM sells business and home computers, notebooks, servers, thin clients, networking equipment, and peripherals. The build-to-order option allows buyers to customize a new desktop PC. Linux is an option on laptop models.

idot.com

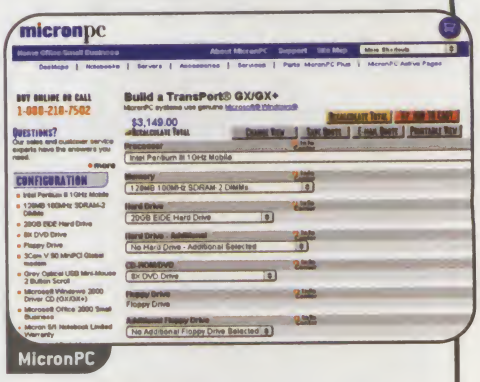
From low-cost budget models to powerful monster machines, **iDot** offers customized desktop and notebook computers with a good return policy.

microexpress.net

Micro Express offers built-to-order desktop and notebook computers featuring AMD and Intel processors. Each system includes a 30-day guarantee and a two- or four-year warranty. Business leases are available.

micronpc.com

One of the largest direct PC vendors, **MicronPC** sells computers to home-office users, larger businesses, government buyers, and buyers outside the United States. The Factory Outlet offers refurbished and discontinued systems.



PC Cooling Products

1coolpc.com

1CoolPC specializes in fans, heat sinks, and other temperature-regulation devices for your CPU, monitor, hard drive, and other components. If you're feeling paranoid despite those additions, the site offers temperature monitors and alarms to alert you should things get too hot.

pcpowercooling.com

Keep your cool with **PC Power & Cooling.** You'll find system fans, drive coolers, card coolers, and many choices in CPU coolers. The site stocks an extensive line of PC power supplies, and an interactive tool helps you choose the right one. Check out the informative tips on maximizing airflow and minimizing operating temperature.

plycon.com

For serious overclockers (or those who compute in the Mojave desert) **Plycon's** catalog includes water-cooling kits for your PC. You'll also find heat sinks of all sizes, fan adapters, and CPU spacers for hardware hackers.

thecardcooler.com

The Card Cooler markets an astounding selection of fans and heat sinks to draw heat out of your overworked PC. Check out the computer cases specifically designed for cooling—we found one that has six built-in fans to keep your PC downright frigid.

3dcool.com

In addition to the usual selection of fans, **3DCool.com** sells unusual cooling gadgets, such as a digital thermometer that mounts in your PC's drive bay, and cooling devices for laptops. Try to keep your cool when checking out; you won't find the standard shopping-cart feature of most e-commerce sites.

2cooltek.com

2CoolTek is not only a Web store, but also a catchall resource site dedicated to the art of PC cooling. You'll find articles about the latest products and cooling hacks, a message board, and a news archive. The product selection includes video coolers, thermal compounds, fan grilles, and air filters.

www.mwmicro.com

Go MidWest, young man. **MidWest Micro** delivers down-home, custom-configured desktops, servers, and notebook systems. The site's Service Center is exemplary, with a troubleshooting knowledge base and driver downloads that cater to your particular system.

nutrend.com

Custom-configure a home or business desktop PC at **NuTrend Computer Products.** The company stocks machines running your choice of Intel or AMD processors. Each system comes with a three-year warranty.

www.polywell.com/onlinestore

Polywell Computers may not be a household name, but the company offers desktops, workstations, and servers that are worth a look. You'll find massive custom-configuration options.

www.sagernotebook.com

Specializing in notebook computers, **Sager** offers a variety of options, from budget machines to speedy multimedia units. Service includes a 72-hour repair-turnaround guarantee and lifetime free tech support. Business leases are available.

shopprostar.com

Each computer in **ProStar Computer's** line of notebook PCs is backed by a 30-day money-back guarantee, a speedy-repair promise, and free tech support. The handy comparison tool helps buyers zero in on the best model.

sonystyle.com

SonyStyle sells Sony's line of VAIO desktops and notebooks, plus digital cameras, displays, and storage devices. The Xtras Direct section of the site carries add-ons for PCs, digital cameras, and other equipment.

store.apple.com

Apple Computer's well-designed site allows you to custom-configure any Macintosh computer and

offers a wide array of Mac-compatible software and accessories. Beware the one-click ordering feature, however—using it may be a bit too convenient for impulse buyers!

www.tiny.com/us

Britain's favorite direct computer seller is now targeting us Yanks. **Tiny Computers'** line of prebuilt desktop and notebook PCs includes models for professionals and first-time buyers.

unitedmicro.com

Take home a preconfigured Intel- or AMD-based PC, or start with a bare-bones system and let **United Micro** install the components of your choice.

www.winbook.com

Focusing exclusively on portables, **WinBook Computer** offers machines with a 30-day money-back guarantee, a one-year warranty, and free technical support. Ironically, some of the site's best deals, the daily "Web specials," can only be ordered by phone.

<PC Resources

consumerreview.com

ConsumerReview.com helps consumers research products before they buy. The site provides more than 200,000 reviews and ratings for tech gadgets and products for the home, car, and kids.

dcresource.com

The **Digital Camera Resource Page** is an unbiased, comprehensive source of information for digital-camera buyers and owners. Shoppers can glean necessary info from the FAQ page, buyer's guide, message boards, and reviews.

dealnews.com

Deal yourself in! **Dealnews** is a fantastic buyer's guide that reports on low-price specials in Web stores. Updated daily, the site discovers deals that range from tempting to nearly impossible to resist. Check out sister site **Dealmac** for Mac-oriented gotta-haves.

dealtime.com

DealTime.com is an independent comparison-shopping service. The site aggregates prices from hundreds of online merchants, auctions, and classified sites. Also, 21st-century shoppers can compare prices by cell phone or wireless PDA, thanks to the site's mobile service.

expertcity.com

Expertcity.com promises live, 24-hour computer assistance from real human beings. When you pose a question, experts across the Internet bid for your business. Read their profiles, compare prices, then choose the expert you like.

SITE REVIEWS

56k.com

See **56K.com** for a primer on 56kbps modems, a price shopper for buying a modem at the best price, and downloads of the latest firmware. Read the special report on the new V.92 modems.

www.ftc.gov

The **Federal Trade Commission's** Web site is packed with useful information about consumer fraud and how to avoid it—online and off. If you've had a problem with a merchant, you can file a complaint with the FTC Bureau of Consumer Protection online.

gomez.com

Gómez.com offers ratings and customer reviews of e-commerce sites in two dozen categories, ranging from Web-based computer stores to drugstores, apparel vendors to online brokers. Check the ratings on ease of use, customer confidence, and cost.

www.linhardware.com

Will that sleek new laptop run Linux? Find out with the **ZDNet Linux Hardware Database,** where users share their experiences regarding which hardware's compatible with Linux—and which isn't. For the stuff that is, download the appropriate driver and put it to work. (ZDNet is owned by CNET Networks, *Computer Shopper's* parent company.)

motherboards.org

Motherboard HomeWorld is packed with motherboard news, reviews, specifications, and tips. Its comprehensive database of 1,200 products includes driver information, technical details, and overclocking hints.

nextag.com

NexTag is a sophisticated buying service that can help frugal shoppers find the lowest possible prices on computer equipment, electronics, books, music, and videos. Entering your ZIP code allows NexTag to calculate shipping and tax for accurate pricing.

pdastreet.com

No matter which PDA you use, there's something for you at **PDAStreet.com.** This multifaceted site delivers reviews, software downloads, user tips, and classified ads for Windows CE, Palm, Visor, Psion, and RIM users.

resellerratings.com

Want a second opinion before you share your credit-card number with an unfamiliar online merchant? Check **ResellerRatings.com,** which provides customer evaluations of online hardware vendors. Take reviews with a grain of salt: We've seen dozens of negative messages posted by one (very unhappy) person.

techsupportalert.com

Tech Support Alert helps computer users locate the best tech-support information on the Net. You'll find reviews of free and pay-for-support sites, plus how-to guides for Windows users.

windrivers.com

WinDrivers.com is a comprehensive archive of drivers and DLL files for hard drives, sound cards, scanners, and other hardware. The site also provides links to antivirus updates and BIOS upgrades.

<Software Sites

arcamax.com

Among other items, **ArcaMax** carries a selection of Windows and Mac software, most priced at $7.95—and all with free shipping. Choose from business software, clip art, games, and reference titles, with lots of options for kids and adults.

beyond.com

Beyond.com presents software for PC, Mac, and PDA users. In addition to traditional boxed titles, the site sells downloadable software from major publishers and a respectable selection of computer hardware. (CNET Networks, *Computer Shopper's* parent company, is an investor in Beyond.com.)

buypcsoft.com

Buypcsoft.com offers software for Windows PCs in categories from business management to voice recognition. It's an efficient site with a good selection and high ratings among previous and current customers.

chumbo.com

In addition to tons of Windows programs and DVD movies, **Chumbo.com** features PDA software and a Linux Store that sells applications for the popular alternative OS.

compuexpert.com

If you crave games for your Mac or PC, stop by **Compuexpert.com.** The well-stocked categories include racing simulations, sports games, strategy games, and adventure titles. Colorful descriptions and multiple screenshots are given for most titles.

SITE REVIEWS

cws.internet.com

Stroud's Consummate Winsock Applications List is the ultimate one-stop download site for Internet software, including Web-development tools, browsers, and chat clients. You'll find comprehensive file lists, ratings, and extensive reviews. A free newsletter provides summaries of new software releases.

download.cnet.com

CNET Download.com will help you find shareware and free software, linking to thousands of PC, Mac, Linux, and PDA titles. Well-written newsletters and down-to-earth reviews help you to locate the perfect program. (CNET Networks is *Computer Shopper's* parent company.)

dragon.ca

When we think of Canada, three things come to mind: Mounties, ice hockey, and **The Dragon's Den.** This popular site sells video games for the PC, PlayStation, and other consoles. They're quite used to selling to their southern neighbors—prices are available in U.S. dollars, and shipping is very affordable.

ebgames.com

The online arm of the ubiquitous Electronics Boutique stores, **EBGames.com** is a video-game player's paradise, offering over 3,000 products. Its home page highlights new releases, coming-soon titles, and top sellers. Bargain hunters will love the long list of preowned titles available at significant discounts.

freewarefiles.com

Windows users who want software without having to spend any money can start at **Freeware Files.com.** This site features quick links to the most popular giveaways.

fscentral.com

PC and Mac aviation addicts are cleared for landing at **Flight Sim Central.** The site offers a hangar full of flight-simulator software, plus specialty hardware like flight yokes and simulated avionics.

handango.com

Handango offers hundreds of commercial software downloads for Palm OS, Pocket PC, Windows CE, and RIM handhelds. Newbies can start with the site's tutorials and recommendations for first-time buyers.

jumbo.com

Jumbo is the perfect name for this monstrous file archive, which features programs for sale, commercial-application demos, shareware, and freeware. Jumbo Guides offer articles on backing up, sharing MP3s, and other computing topics.

linux2order.com

Linux2order offers more than 10,000 Linux and open-source applications. You can pick and choose software, or grab a prebuilt distribution. Get your software on a $5 custom-burned CD, as a free standard download, or as a high-speed download for a subscription fee.

999central.com

The price is right at **999central.com,** which stocks 500 software and 200 DVD titles, most for $9.99. Educational, entertainment, and lifestyle applications are the most common.

softwareoutlet.com

Calling all cheapskates! Come check it out. **SoftwareOutlet.com's** a veritable virtual bargain bin. You'll find dirt-cheap apps—older versions, titles from defunct companies, or just plain funky stuff.

www.tucows.com

It's not just bovine bliss: **Tucows** is also an incredible archive of freeware and shareware. Plenty of local mirror sites keep the download process speedy. The category list and reviews make finding the software you seek a breeze.

wiredlounge.com

Here's a site hard-core gamers will want to plug in to. **Wired Lounge** serves up recently released games for PCs and consoles. The site is packed with refreshingly honest reviews, coupled with plenty of screenshots to whet your appetite.

zdnet.com/downloads

You'll need more bandwidth. Download shareware, freeware, and demos from **ZDNet Downloads.** The site offers daily software highlights and quick links to the week's most popular software. Every program is rated, reviewed, and checked for viruses, so your new software won't come with any unpleasant surprises. (ZDNet is owned by CNET Networks, *Computer Shopper's* parent company.) ▼

Researching a Long-Distance Calling Plan

abtolls.com

Do you know for whom the bell tolls? **ABTolls.com** is a directory of long-distance service rates, serving up comparisons of international, in-state, and state-to-state fees. Read the site's consumer advice, which includes articles on how to read your phone bill and understanding those mysterious monthly fees.

www.fcc.gov/marketsense

The **Federal Communications Commission Market Sense** page offers unbiased tips on choosing the best long-distance deals, including advice on avoiding scams. Take a moment to read the Top Ten Telecom Tips, useful and easy-to-follow guidelines to help you get the best plan.

www.ftc.gov/bcp/menu-call.htm

The **Federal Trade Commission's** consumer protection page offers helpful information for anyone who uses a telephone. Articles include "Buying Time: The Facts About Pre-Paid Phone Cards," "Long Distance Deals," and "Making Sense of Long Distance Advertising." The site also catalogs current federal telecommunications rules and acts.

smartprice.com

SmartPrice.com serves up side-by-side comparisons of long-distance carriers in your geographic area, virtually assuring that you pick the plan best suited for you. If you have a copy of a recent phone bill and a few minutes to spare, you can use the Detailed Analysis page to see which options will work best with your calling patterns.

www.1010dialaroundplans.com

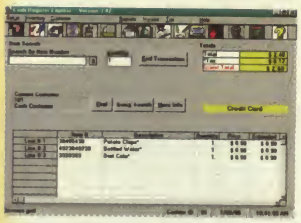
This site offers comprehensive information about **10-10 Dial Around Plans,** those dialing codes that route your call through a particular long-distance carrier. If you choose the right one based on your calling patterns, you can save money. Start by reading the site's FAQ, then compare rates for national and international dial-around plans.

www.thedigest.com

Discount Long Distance Digest is a free online newsletter covering the long-distance telephone industry. The site offers consumer shopping tips and roundups of the lowest-price long-distance plans for residential and business customers.

Cash Register Express Software
for Windows...$495

Computerize any type of retail store using Cash Register Express for Windows. Computerization pays for itself, saving you thousands of dollars, giving you peace of mind, and making the best use of your time. Cash Register Express



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All PC America Software requires Microsoft Windows. The software was written in Visual Basic using Microsoft Access Files. The source code is available.

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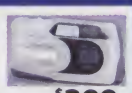

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24 10/100BASE-TX FE ports, exp slot	(3C16980)	$1049

• ETHERNET NIC Cards By 3Com •

10 ISA TPO Network	(3C509B-TPO)	$59
10 ISA Combo Network	(3C509B-CMB)	$119
10/100 PCI Network	(3C905B-TXNM)	$59
10 Fiber Network	(3C900B-FLST)	$159
100 PCI Fiber Network	(3C905B-FXSC)	$245
10 PCI TPO Network	(3C900B-TPO)	$59
10 PCI Combo Network	(3C900BCOMBO)	$125
10/100 PCI Combo Network	(3C905BCOMBO)	$135
10/100 PCI Network	(3C980C-TXM)	$95

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ULTRA ATA HARD DRIVES

Capacity	Buffer	Speed	Part Number	Int.
IBM				
20.0GB	2MB	7200	07N6652	$98
40.0GB	2MB	7200	07N6654	$135
60.0GB	2MB	7200	07N6655	$203
76.8GB	2MB	7200	07N3935	$259
Quantum				
10.0GB	128K	4500	QML10000LD	$75
10.2GB	2MB	7200	QMP10200AS	$85
20.0GB	128K	4500	QML20000LD	$89
20.5GB	2MB	7200	QMP20500AS	$99
30.0GB	128K	5400	QML30000LD	$95
30.0GB	2MB	7200	QMP30000AS	$120
40.0GB	128K	5400	QML40000LD	$108
40.0GB	2MB	7200	QMP40000AS	$140
60.0GB	2MB	7200	QMP60000AS	$185
Western Digital				
10.0GB	2MB	5400	WD100EB	$75
20.0GB	2MB	5400	WD200EB	$78
20.0GB	2MB	7200	WD200BB	$87
30.0GB	2MB	5400	WD300AB	$89
30.0GB	2MB	7200	WD300BB	$110
40.0GB	2MB	5400	WD400AB	$105
40.0GB	2MB	7200	WD400BB	$128
60.0GB	2MB	5400	WD600AB	$153
60.0GB	2MB	7200	WD600BB	$195
80.0GB	2MB	5400	WD800AB	$207
80.0GB	2MB	7200	WD800BB	$225
Maxtor *Ultra 100*				
10.0GB	2MB	5400	2R010H1	$78
15.0GB	2MB	5400	2R015H1	$85
10.0GB	2MB	7200	M5T010H1	$85
20.0GB	2MB	7200	M5T020H2	$95
30.0GB	2MB	7200	M5T030H3	$115
40.0GB	2MB	7200	M5T040H4	$135
60.5GB	2MB	7200	M5T060H6	$185
81.9GB	2MB	5400	M981196H8	$225
100.0GB	2MB	5400	4W10086	$275
Fujitsu				
20.4GB	512K	5400	MPG3204AT	$78
30.7GB	512K	5400	MPG3307AT	$105
40.9GB	512K	5400	MPG3409AT	$119

USB DRIVES & ACCESSORIES

4x4x6 CD Rewritable for PC or Mac (CDWS4EUSB)	$175
2.2GB Orb (ORBUSB)	$174
USB to SCSI Adapter (USBSCSI)	$59
SuperDisk Drive 120MB & Floppy (USBLS120)	$145
1394 USB/PCI Board (70HTL00060)	$115
Floppy Drive (USBFLOPPY)	$85

USB 3.5" Hard Drives w/ Case (5400 RPM)

10.0 GB	USB10GB	$179 /	**20.0 GB**	USB20GB	$189
30.0 GB	USB30GB	$209 /	**40.8 GB**	USB40GB	$219
60.0 GB	USB60GB	$275 /	**81.9 GB**	USB80GB	$345

1394/FIREWIRE PRODUCTS

1394 PCMCIA CardBus (70HTL00040)		$85
1394 USB/PCI Board (70HTL00060)		$115
1394 PCI/Mac Board Kit (70HTL13941)		$59
1394 Hub (70HTL00030)		$85
1394 Repeater:	(70HTL00020)	$45
1394 15 Ft. Cable: 6pin to 4pin	(70CAB13943)	$15
1394 15 Ft. Cable: 6pin to 6pin	(70CAB13942)	$19

1394 3.5 Hard Drives w/Case (7200 RPM)

10 GB	FW10GB72	$219 /	20 GB	FW20GB72	$239
30 GB	FW30GB72	$269 /	40 GB	FW40GB72	$279
60 GB	FW60GB72	$365 /	76 GB	FW76GB72	$414

1394 3.5 Hard Drives w/Case (5400 RPM)

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40.0 GB	FW40GB54	$249 /	60.0 GB	FW60GB54	$309
81.9 GB	FW80GB54	$375			

ZIP & JAZ DRIVES / MEDIA

IOMEGA 100MB ZIP

Int. IDE [ZIP100A] / 5 Pack [ZIP100A-5]	$59/$279
Parallel Ext. [PPZIP100]	$79
Ext. USB [ZIP100USB]	$79
Zip media [ZIP100C] 2-9/10+	$12/10

IOMEGA 250MB ZIP

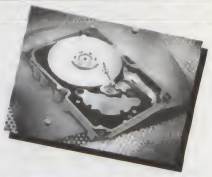
Int. IDE [ZIP250A]	$109
Ext. for PC Parallel Port [PPZIP250]	$109
Ext. USB for PC or Mac [ZIP250USB]	$135
Ext. SCSI for PC or Mac [ZIP250]	$109

IOMEGA 2GB JAZ

Internal SCSI [JAZ2I]	$249
External SCSI [JAZ2X]	$319
Jaz 1 GB media [JAZ1GIGPC] 2-5/5-9/10+	$80/77/75
Jaz 2 GB media [JAZ2GIGPC] 2-5/5-9/10+	$85/80/77

ULTRA/160 SCSI HARD DRIVES

Seagate



Seagate drives feature the industry's most complete protection solution for data.

Capacity	Buffer	Speed	Part Number	Int.	Ext.
9.2GB	4MB	10,000	ST39205LW	$175	$305
18.4GB	2MB	7200	ST318437LW	$189	$319
18.4GB	4MB	10,000	ST318405LW	$209	$339
18.4GB	4MB	15,000	ST318451LW	$339	$469
36.7GB	2MB	7200	ST336737LW	$335	$465
36.7GB	4MB	10,000	ST336705LW	$409	$539
73.4GB	4MB	10,000	ST373405LW	$779	$909
73.4GB	16MB	10,000	ST373405LWV	$829	$959
181.6GB	4MB	7200	ST1181677LW	$1489	$1619
181.6GB	16MB	7200	ST1181677LWV	$1539	$1669

Quantum.

Leads the Way in Performance and Reliability

Capacity	Buffer	Speed	Part Number	Int.	Ext.
9.2GB	4MB	7200	XC309100LW	$169	$299
9.2GB	8MB	10,000	TY309200LW	$179	$309
18.4GB	4MB	7200	XC318400LW	$203	$333
18.4GB	8MB	10,000	TY318400LW	$236	$366
36.7GB	4MB	7200	XC336700LW	$369	$499
36.7GB	8MB	10,000	TY336700LW	$429	$559
73.4GB	8MB	10,000	TY373400LW	$829	$959

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Ultra 160 SCSI

Capacity	Buffer	Speed	Part Number	Int.
9.1GB	4MB	10,000	07N3220	$155
18.3GB	4MB	10,000	07N3210	$185
36.7GB	4MB	10,000	07N3200	$355

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COMPLETE KIT	PLATINUM	BLACK
Includes 1 frame, and 1 cartridge		
IDE 66 with plastic cartridge (DP2200A66)	$79	N/A
IDE 66 with metal cartridge (DP2200AM66)	$87	$96
ULTRA WIDE SCSI (DP2200UW)	$105	N/A
EXTRA CARTRIDGE		
Plastic IDE 66 (DPACART66)	$42	N/A
Metal IDE 66 (DPACARTM66)	$50	$60
ULTRA WIDE SCSI (DPUWCART)	$61	N/A
EXTRA FRAME		
IDE 66 (DPAFRAME66)	$44	
ULTRA WIDE SCSI (DPUWFRAMEA)	$51	

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ATI RAGE FURY PRO	(100-416237)	$72
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Studio DC10plus Motion-JPEG Video Capture Kit	(160300010R)	$87
MicroVIDEO DV500+ Digital Video Editing Kit	(210100093)	$695
MicroVIDEO DV200 FireWire Editing Kit	(210100094)	$259
MicroVIDEO DC30pro Dig. Video Editing Soft.Kit	(330001)	$459
MicroVIDEO DV1394 PCI Video Editing Kit	(13SSTDDVN)	$87

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Total Cap	#Drives	Each Drive/Speed	Item No.	Price
45GB	5	9GB/7200rpm	ARR45-7EX	$2189
72GB	4	18B/10,000rpm	ARR72-10EX	$1959
90GB	5	18GB/7200rpm	ARR90-7EX	$2679
144GB	4	36GB/10,000rpm	ARR144-10EX	$3039
216GB	6	36GB/7200rpm	ARR216-7EX6	$4279
252GB	7	36GB/10,000rpm	ARR252-10EX	$5219

• SCSI RAID-READY Drive Enclosures w/DataPorts •

#DataPorts	Interface	Item No.	Price
2	Ultra2 SCSI	FHCASEUSW	$549
4	UltraWide SCSI	DUALCASEUSW	$659
8	Ultra2 SCSI	QUADCASE8U2	$1179

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2 Drive Desktop Model (FHCASEUSW) $549

4 Drive Desktop Model (DUALCASEUSW) $659

These hard drive enclosures are perfect for RAID or multiple drive applications. They feature hot swapable drive shuttles, and large cooling fans. These cases use a special backplane technology that allows you to use Wide SCSI, Ultra Wide SCSI, or Ultra-2 LVD hard drives without the normal cable length problems. Add drives and an Adaptec RAID controller for your complete high-end RAID solution. We are the Number One source for RAID in the US. Call our experts & let us configure one for you.

7 Drive Desktop Model (QUADCASEUSW) $1089
8 Drive Desktop Model (QUADCASE8U2) $1179

7 Drive Desktop Model (RACKCASEUSW) $1129
8 Drive Desktop Model (RACKCASE8U2) $1239

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Brand	Model	Max Spin	Speed	Internal	External
Teac	CD532S	32X	85ms	$72	$132
NEC	CDR3010	40X	85ms	$67	$127
Toshiba	XM6401B	40X	85ms	$69	$129
Plextor	PX40TS(tray)	40X	85ms	$87	$147

• WIDE SCSI CD ROM Drives •

Plextor	PX40TSUW	40X	85ms	$99	$189

• Atapi CD ROM Drives (IDE) •

					Parallel Port
Teac	CD540E	40X	85ms	$43	$98
Mitsumi	CRMCFX48X	48X	65ms	$39	$95
Creative	SBCD52	52X	100ms	$37	$95
Sony	CDU5211	52X	85ms	$39	$95
Acer	CD656A	56X	85ms	$39	$95

• CD ROM Towers •

Above drives configured in multiple drive towers. For fast access to multiple CD's at one time. Perfect for schools, networks, and more.

We have towers from 2 drives to 14 drives and up to 52X.

Call us for custom configurations - including CD Rewriters!

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Auto-switches between 10BaseT or 100BaseT Ethernet connection. Hooks directly to your network. Designed for mixed LAN environment - can be used simultaneously from Win 95, NT, Win for Workgroups, OS/2, HTTP, Mac, and UNIX. Pre-assembled.

40x drive speed, 8 drive tower. (MIT40X8N)	$1189
48x drive speed, 8 drive tower. (MIT48X8N)	$1295

• IDE CD Rewriters (Int. / incl. software, 1R & 1RW disk) •

Hewlett Packard 12x8x32 IDE		(C4502A)	$125
Teac 12x10x32 IDE		(CDW512E/KIT)	$155
Plextor 12x10x32 IDE		(PXW121032R)	$159
Sony 16x10x40 IDE		(CRX168B/A1)	$185
Yamaha 16x10x40 IDE	Bare Drive	(YCRW2100E)	$139
Plextor 16x10x40 IDE		(PXW1610TAR)	$199
TDK 16x10x40 IDE		(ACDRW161040)	$189
Acer 16x10x40 IDE		(ARCRW1610A)	$179
Yamaha 20x10x40 IDE		(CRW2200EZ)	$239

• SCSI CD Rewriters •

Plextor 12x4x32 SCSI	Int/Ext	Bare	(PXW12432B/X)	$199/ $249
Plextor 12x10x32 SCSI	Int/Ext	Bare	(PXW1210TSB/X)	$235/ $295
Yamaha16x10x40 SCSI	Int/Ext	Bare	(YCRW2100S/X)	$219/ $279

• USB & 1394 CD Rewriters •

Hewlett Packard 4x4x6 USB	(C4540A)	$175
Teac 4x4x6 USB	(CDWS4EUSB)	$175
Sony 12x8x32 1394	(CRX1600L/A2)	$235
FireWire 16x10x40 (w/ Plextor Drive)	(FW16X10X40P)	$339
Yamaha 16x10x40 1394	(CRW2100FXZ)	$309

• CD RECORDABLE MEDIA •

CDR-74 in jewel case		
16x	Budget 5/20/50/100 pack	$4/$15/$35/$66
16x	Standard 5/20/50/100 pack	$6/$24/$56/$105
12x	Platinum 5/20/50/100 pack	$6/$24/$57/$106
Printable CDR-74 in jewel case		
16x	Budget 5/20/50/100 pack	$4/$15/$35/$66
16x	Standard 5/20/50/100 pack	$7/$26/$62/$115
CDR-80 80 minute media		
16x	Budget 5/20/50/100 pack	$4/$13/$32/$59

• CD REWRITABLE MEDIA •

CDR-74W in jewel case		
4x	Budget 5/20/50/100 pack	$6/$24/$56/$104
4x	Standard 5/20/50/100 pack	$9/$35/$79/$159
10x	Standard 5/20/50/100 pack	$15/$59/$145/$279

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Bare	Interface	CD Speed	DVD Speed	Part #	Price
Pioneer	IDE (tray)	40X/80ms	16X,110ms	DVD116	$69
Pioneer	IDE (slot)	40X/80ms	16X,110ms	DVD106	$75
Pioneer	SCSI	40X/90ms	10X,120ms	DVD305	$99

Record your own DVD movies!

DVD Recorder, DVD-R write 1x, DVD-R read 2x, 4MB buffer, includes software and 3 DVD disks #DVRS201 $3989
IDE DVD Recorder, DVD-R write 2X, DVD-R read 4X, 2 MB buffer, includes software + media #DVR-A03 $789

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Bare	Interface	CD Speed	DVD Speed	Part #	Price
Toshiba	IDE	48X/95ms	16X, 115ms	SDM1502	$69

Complete DVD Kits

MegaHaus 16X Drive Kit [DVD16KIT]	$129
Creative Encore 12X DVD Drive Kit [CLDVD12KIT]	$135
Hollywood MPEG-2 Decoder [HOLLYWOOD]	$55

Waveless wireless transmitter allows you to transmit DVD movies from computer to TV [PCTOTV] $89 or $84 w/DVD drive.

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LTO Viper Ultra2 SCSI Bare Internal Tape Drive (STU42001LW-S) $ 5015
LTO Viper Ultra2 SCSI Internal Tape Drive Kit (STU42001LW-K) $ 5131
LTO Viper Ultra2 SCSI Bare External Tape Drive (STU62001LW-S) $ 5306
LTO Viper Ultra2 SCSI External Tape Drive Kit (STU62001LW-K) $ 5425

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Model	Processor	Display	Ram/HD/CD/Mod	Price
THINKPAD A SERIES				
A22M-Q1U	Pentium® III 800	12.1 TFT	64/20/24X/56k	1499.99
A22M-R1U	Pentium® III 850	14.1 TFT	64/20/DVD/56k	1899.99
A22P-U1U	Pentium® III 900	15 TFT	64/20/DVD/56k	2199.99
A22M-T1U	Pentium® III 1000	14.1 TFT	128/30/DVD/56k	2499.99
A22P-U1U	Pentium® III 1000	15 TFT	128/30/DVD-RW/56k	CALL
THINKPAD T21-4AU				
Pentium® III 800 Mhz Processor				
14.1" Active Color Display, 128 Mb Ram/20 Gb HD, 8X DVD-Rom, 56k Modem 10/100 Ethernet				$1899.99
THINKPAD T SERIES				
T21-47U	Pentium® III 800	14.1 TFT	128/20/DVD/56k	1999.99
T21-57U	Pentium® III 850	14.1 TFT	128/32/DVD/56k	2199.99
T22-4CU	Pentium® III 900	14.1 TFT	128/20/DVD/56k	2499.99
T22-5CU	Pentium® III 1000	14.1 SXGA	128/32/DVD/56k	CALL
THINKPAD i SERIES				
1200i-42U	Celeron® 600	12.1 TFT	64/10/24X/56k	899.99
1200i-51U	Celeron® 600	12.1 TFT	64/10/DVD/56k	1099.99
1200i-92U	Pentium® III 700	13.3 TFT	64/10/DVD/56k	1399.99
1300i-7WU	Celeron® 700	13.3 TFT	64/10/24X/56k	1399.99
1300i-8MU	Celeron® 750	13.3 TFT	64/20/CD-RW/56k	1699.99
1300i-9MU	Pentium® III 750	13.3 TFT	64/20/CD-RW/56k	1799.99

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Celeron® 600 Mhz Processor
13.3" Active Color Display,
64 Mb Ram/10Gb HD,
DVD-Rom, 56k Mod.
$1199.99

THINKPAD X SERIES

X20-11U	Celeron® 500	12.1 TFT	64/10/OPT/56k	999.99
X20-31U	Pentium® III 600	12.1 TFT	128/20/OPT/56k	1899.99
X21-61U	Pentium® III 700	12.1 TFT	128/20/OPT/56k	2199.99

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$1999.99

Model	Processor	Display	Ram/HD/CD/Mod	Price
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611TXCI	Pentium® III 850	14.1 TFT	128/20/DVD-RW/56k+Lan	2449.99
738 TLV	Pentium® III 750	15 TFT	128/18/DVD/56k	2199.99
739 GTLV	Pentium® III 1000	15 TFT	128/30/DVD/56k	2499.99

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527TXV	Pentium® III 800	14.1 TFT	128/10/DVD/56k/Eth	1799.99

TRAVELMATE 353TEV
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Model	Processor	Display	Ram/HD/CD/Mod	Price
VAIO SERIES				
FX210	Duron® 800	14.1 TFT	128/10/DVD/56k	1349.99
FX240	Pentium® III 800	14.1 TFT	128/15/DVD/56k	1799.99
FX250	Pentium® III 800	15 TFT	128/20/DVD-CDRW/56k	1999.99
FX270	Pentium® III 850	15 TFT	192/20/DVD-CDRW/56k	2299.99

PCG-FX290
Pentium® III 1GHz Processor
15" Super XGA Display 1400x1050 Res.
256Mb Ram/30Gb HD,
Combo DVD, CD-RW Drive
10/100 Lan & 56k Modem
$2799.99

WINDOWS® 2000 MODELS

FX220K	Pentium® III 750	15 TFT	128/15/DVD/56k	1599.99
FX240K	Pentium® III 800	14.1 TFT	128/15/DVD/56k	1899.99
FX250K	Pentium® III 800	15 TFT	128/20/DVD-CDRW/56k	2099.99
FX270K	Pentium® III 850	15 SXGA	192/20/DVD-CDRW/56k	2499.99
FX290K	Pentium® III 1000	15 SXGA	256/30/DVD-CDRW/56k	2999.99

SONY

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Model	Processor	Display	Ram/HD/CD/Mod	Price
XG-700	Pentium® III 750	14.1 TFT	128/20/DVD-RW/56k	1899.99
XG-700K	Pentium® III 750	14.1 TFT	128/20/DVD-RW/W2K	1699.99

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12x10x32	IDE	Creative Labs CDB121032	$126	$166
12x10x32	IDE	Plextor PX-W1210TA/SW	$170	$210
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16x10x40	IDE	Teac CDW516E	$160	$200
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16x10x40	IDE	TDK VeloCD 161040	$185	N/A
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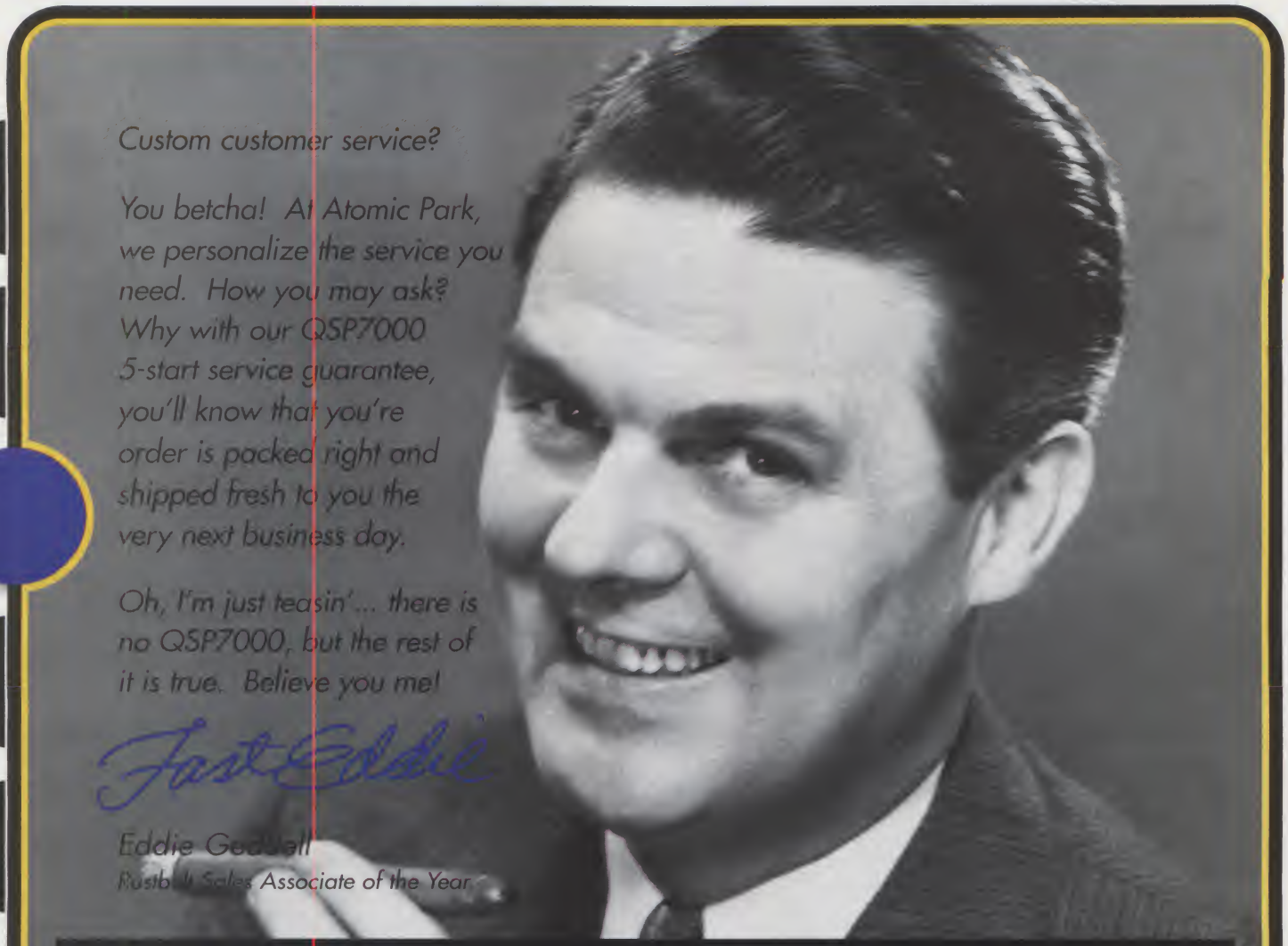

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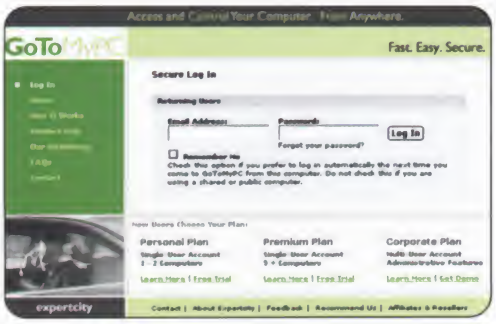

To set it up, you just enter employees' e-mail addresses online and invite them to download and install the software on their PCs, which takes only a few minutes. No software installation is required either on the accessing end or on your corporate servers. The service is firewall-friendly, so your security measures remain intact. You can invite, suspend, or cancel an account at any time, check status and usage statistics for individuals and groups, see the status of users online, and disable or enable specific features.

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Where the Money's Going

Venture-capital firms, corporations, and individuals invested in about half as many companies in the first quarter of 2001 as they did in the same quarter last year (691 versus 1,366). The top three recipients by category in the first quarter of 2001 were software, consumer and business services, and communications.

Industry Segment	Q1 '00	Q1 '01
Medical*	146	102
Communications	165	109
Consumer/Business Products	9	6
Consumer/Business Services	438	162
Electronics	21	18
Industrial	14	19
Information Services	195	59
Retailers	58	12
Semiconductors	39	35
Software	281	169
Total (number of companies)	**1,366**	**691**

* = Includes biopharmaceuticals, health-care services, medical devices, and medical information services

SOURCE: VENTUREONE/PRICEWATERHOUSECOOPERS, 2001

ILLUSTRATION BY BEK SHAKIROV

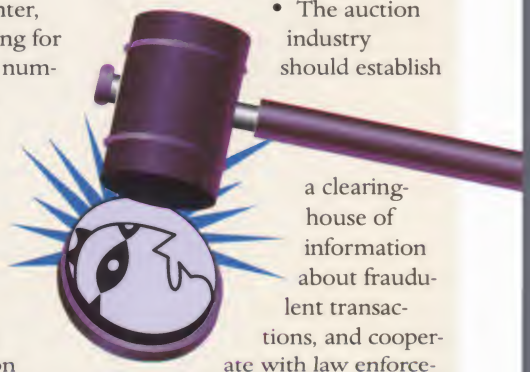
Auction, Heal Thyself

With waves of inventory from downed dot-coms flooding the auction markets, businesses bidding for these goods have to be careful not to get burned. Fraud on the Net is rising, and auctions account for the lion's share of it. In 2000, Internet-based fraud totaled more than $3 million, according to the National Fraud Information Center, with auctions accounting for 78 percent of the total number of reported scams.

Hoping to address this problem, Piyush Gupta, CEO and founder of auction site LiquidPrice.com, has formed the Internet Integrity Alliance (IIA), a group that will concentrate on consumer education and legislative lobbying.

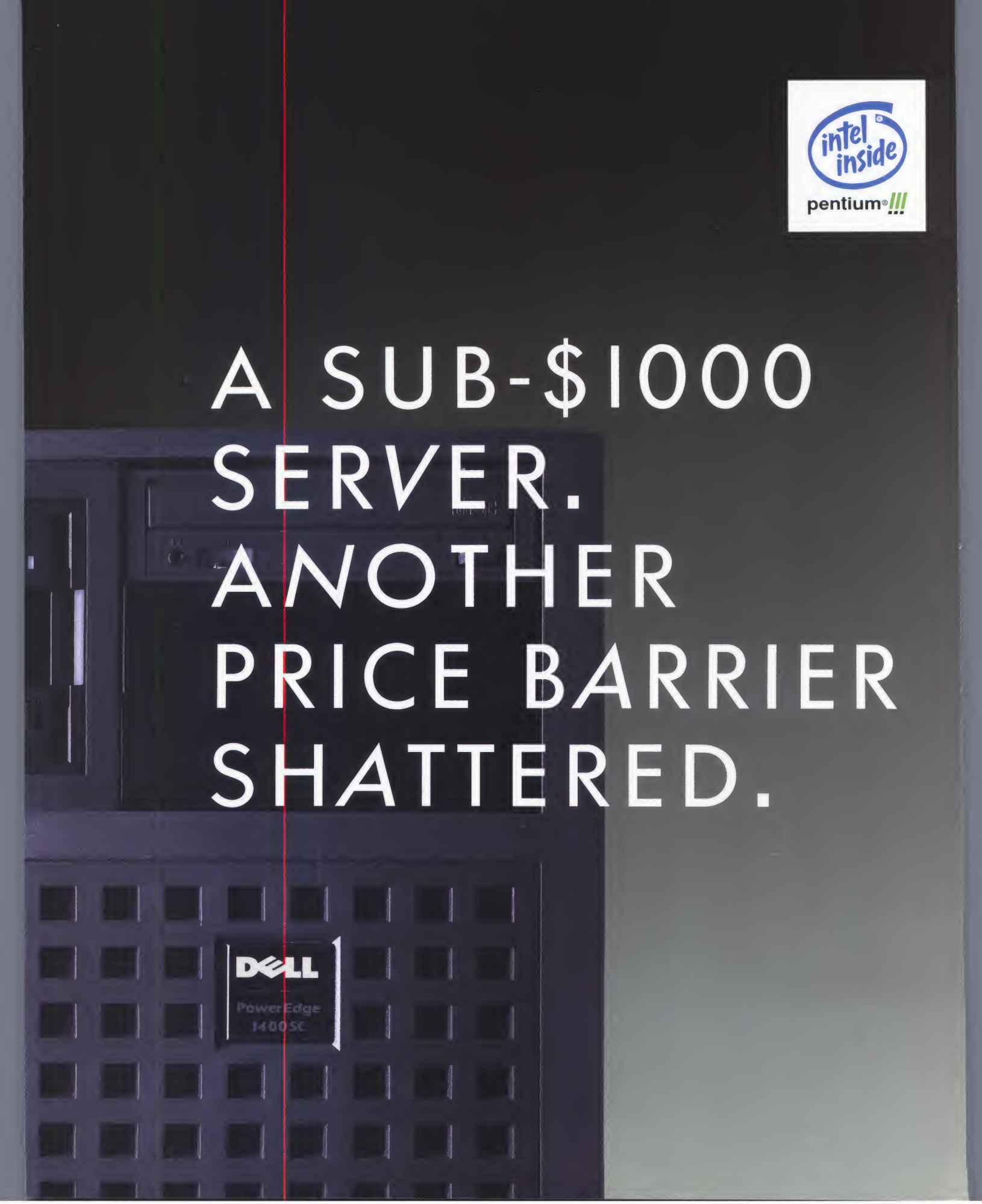
The IIA recently distributed its Bill of Rights for Internet consumers to the CEOs of more than 400 auction sites. At press time, a dozen had expressed interest in joining the effort. Among the proposal's key points:

- Product descriptions should be clear, accurate, and complete.
- Sites should create strict opt-in policies for sharing consumer information with other sites or organizations.
- Sites should offer low-cost insurance for each transaction, with the cost of the premium shared by buyer, seller, and site.
- Sites should designate an ombudsman, at no cost, to assist with complaints.
- The auction industry should establish a clearinghouse of information about fraudulent transactions, and cooperate with law enforcement to educate new users about auction transactions.



Gupta intends to support lobbying efforts for legislation aimed at reducing fraud. He also intends to launch a site with white papers and consumer info. At press time, the IIA was awaiting approval of its not-for-profit status and was in search of funding.

—*Hailey Lynne McKeefry*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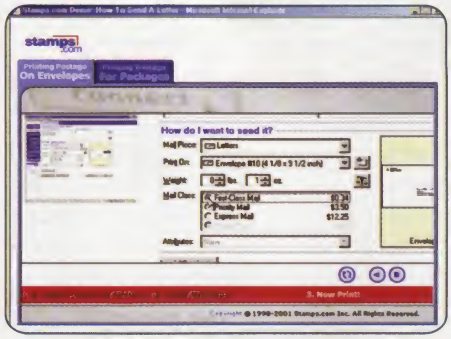
ONLINE POSTAGE SERVICES, OR E-POSTAGE, CAN SAVE YOU TIME BY letting you purchase stamps over the Internet. When you're ready to send a letter or package, just print the postage you need right on an envelope or mailing label. This convenient new service is made possible by the Information Based Indicia Program (IBIP) of the United States Postal Service (USPS). The IBIP is a barcode postage system that lets you print secure mail-processing information. The USPS tightly regulates the number of sites that take part in the IBIP, so purchasing postage in this manner is both safe and secure.

STAMPS.COM

Stamps.com ***(www.stamps.com)*** was one of the first to receive permission from the USPS to offer online postage, and it's benefited from its experience. Getting started is a snap. Just sign up at the Web site and download the Internet Postage software. You'll also need a postage-meter license from the Postal Service, but Stamps.com makes getting one easy. A wizard walks you through the steps of applying for a postage license, and the service submits your application to the USPS electronically. After that, it takes one to three days for your account to become active.

Using the service is just as simple. You can print to almost any kind of envelope or label. Simply run the Internet Postage program, fill in the sender and recipient information, and select Print. The software connects to Stamps.com, checks your postage balance, then authorizes your computer to print. When you run out of postage, just buy more at the Stamps.com Web site.

Stamps.com offers two pricing plans. The Simple Plan carries a monthly fee of 10 percent of the postage printed, with a minimum of $4.49. The Power Plan charges a flat monthly fee of $18.99, regardless of how much postage you buy, and includes toll-free customer support. Both plans give you access to the site's free online help, and both offer free postage at sign-up ($10 with the Simple Plan and $20 with the Power Plan). But the free postage expires within 30 days.



Both ClickStamp Online and Stamps.com make it easy to buy the postage you need right from your PC.

To mail large or stuffed envelopes, both plans require you to estimate the approximate weight of the item and enter that information into the program. For precise measurements, the site will sell you a digital scale. (The Power Plan throws one in for free.)

CLICKSTAMP ONLINE

Pitney Bowes is known more for its low-tech postage scales than for its high-tech Web services, but its state-of-the-art e-postage solution, ClickStamp Online ***(www.pitneyworks.com)***, is changing that. Similar to Stamps.com, ClickStamp Online is a software-based solution you download and run on your PC. Signing up is quick and easy; once you receive a postage-meter license, you can be up and running the same day.

The interface mimics the look and feel of an envelope or label. Just type in your address and the recipient's, enter the correct postage, and select Print. Like Stamps.com, the software checks your account balance with the company's online server before it prints. Unlike Stamps.com, ClickStamp Online costs only $1.49 per month, plus the cost of postage. The site also adds value for business owners by offering promotional tools such as access to mailing lists, site-building assistance, and direct-mail services.

LAST LICKS

Either service can save you time, but the e-postage approach has its drawbacks. Strict USPS regulations require you to enter a return address for each letter or label, so you can't use your preprinted envelopes. Plus, the USPS *must verify* destination addresses, which, depending on your Internet connection, can be a slow process. In addition, you need to go online every time you want to print postage, a hassle if you use a dial-up connection.

One possible workaround is an offline service such as Neopost Online's Simply Postage Promail ***(www.simplypostage.com)***. The startup kit includes an integrated digital scale and printer, and a roll of 100 labels. You sign up and purchase postage from the company's Web site, but the postage itself is stored in the printer, so you can work offline. You pay a one-time fee of $49.95, then $14.95 per month plus the cost of postage. At press time, the company was offering $25 worth of free postage.

For a snail-mail/e-postage combo, check out the good old USPS. Its new NetPost Service ***(www.usps.com)*** lets you buy first-class or certified-mail postage via the Net. After signing up, just upload your document to the site, and enter the sender and recipient information. The USPS will print it out and deliver it via regular mail, saving you a trip to the mailbox or post office. ▼

MANY Happy Returnees

Customer-relationship management tools can keep site visitors coming back for more.

by Jonathan Blackwood

Dealing with customer issues and problems, whether face-to-face or over the phone, can be challenging. Placing that customer at the other end of an Internet connection adds a whole new wrinkle. The difficulties companies face in serving customers' needs via the Web have spawned an entire category of software products, known as customer-relationship management (CRM) tools, designed to make the online relationship just as convenient as the offline one.

Until recently, these tools were out of reach for small companies, because CRM vendors targeted large enterprises. "It's the natural evolution in a new market," says Denis R. Pombriant, research director for CRM for The Aberdeen Group. "Companies target the big guys with deep pockets first before going after the smaller fish. Even now, most CRM solutions are directed at companies with more than $50 million in annual revenue."

Businesses no longer need to spend millions, or even hundreds of thousands, of dollars to integrate CRM tools into their Web sites. The essential components of customer acquisition, support, and retention can be had for prices even small businesses can afford.

Plenty of sites serve as good resources for CRM information. ITtoolbox CRM *(www.crmassist.com)*, CRM Forum *(www.crm-forum.com)*, and CRMGuru.com *(www.crmguru.com)* offer listings of CRM products, consultants, and services, as well as numerous articles and access to free e-mail newsletters. Most articles advise companies to begin by focusing on customers, a step that involves evaluating support strategies and processes.

"Historically, many companies' first step toward CRM was sales-force automation," says Pombriant. "Next came customer service and support." But careful consideration and a willingness to change to benefit customers is the most important key to success.

THE WORKS

One of the oldest providers of online customer-support tools is Siebel Systems. With products in almost every CRM niche, Siebel serves businesses of all sizes, including the small and mid-size companies it defines as those with 50 to 1,000 employees. The company also targets specific vertical markets, including telecommunications, finance, and energy.

Though large enterprise customers such as Ford pay hundreds of thousands of dollars for Siebel's CRM applications and more for implementation services, the company has formed partnerships with both Compaq and IBM to deliver packaged products to smaller companies. It even offers its Siebel Sales Personal Edition 6.0 as a free download at ***www.siebel.com/siebelsales/download.asp.*** This sales and contact-management program is geared toward small- and home-office professionals, and focuses on tracking sales leads and managing contacts and activities. It's a good introduction to the company's products, and if you decide to upgrade later, you can upload data from the Personal Edition to the Midmarket Edition. This product comprises three sets of applications, designed for your employees, your customers, and your partners.

A LA CARTE MENU

If all you're really after is a way to provide round-the-clock customer support, even that function can be outsourced. C-Cubed Solutions *(www.ccubedsolutions.com)* offers live customer "chat" sessions 24/7 at a relatively modest cost by maintaining a support staff in Bangalore, India, the "Silicon Valley"

ILLUSTRATION BY BEK SHAKIROV

of that country, where English is widely spoken. If demand spikes, C-Cubed can triple the staff members assigned to your account within an hour. The setup charge ranges from $5,000 to $10,000, depending on the complexity of your products, and around $500 per operator per month thereafter.

Don't be concerned that chat-based support may be less popular with customers than live phone support. Interviews with top computer companies revealed that online customers, given the choice between chat-based support and speaking with a technician, chose chat-based support by a three-to-one margin. If your customers are on the Web, chances are they're comfortable with instant messaging and online chats.

Once at your site, about a third of your customers will go first to your search function, according to Atomz *(www.atomz.com)*, provider of a "hosted site search engine." The company's Atomz Search product gives you the code you need to provide the site-search function as well as customer-feedback information. Atomz Search is in use by more than 40,000 sites worldwide, according to the company, including those of Macromedia, Webmonkey, and The Bank of Canada.

The service "crawls" your site to perform an initial index, then performs incremental indexes as often as you wish. (Informing you of broken links is an incidental side benefit.) Because the service is a hosted application, someone else handles the maintenance headaches associated with the search function, and the reports and feedback you receive let you tailor your site according to customer desires. Atomz Express Search is free for sites with fewer than 500 pages; Prime Search, which includes the crawling and indexing services, costs $500 per year.

Even the best search engines can leave site visitors frustrated. Hipbone's *(www.hipbone.com)* hosted "cobrowser" application lets you provide live assistance to help customers find what they're looking for. This is a particularly valuable feature for e-commerce sites. Lands' End, whose Web-site business has been more profitable than its catalog sales for the past two years, credits the use of cobrowsing technology. Non-e-commerce sites can also use Hipbone's technology for training purposes, and companies such as insurance and real-estate agencies can use it to help customers complete forms. Basic setup typically costs about $10,000, and the basic service costs $950 per seat per year.

How are you doing so far? You can find out using the Automated Response Watch service from Atesto Technologies *(www.atesto.com)*. It remotely monitors response times for both Web pages and transactions. The service tests your site every 15 minutes from server sites spread around the world, and reports response times in real time. Set a critical level of response, and the service alerts you to poor performance. This gives you the information you need to evaluate issues such as the adequacy of your hosting service, server, or ISP. Pricing starts at $3,500 per quarter for 100 concurrent users.

Maintaining the highest possible customer-satisfaction levels is key to building customer loyalty. But you don't have to go it alone. Plenty of affordable services are available to help you develop a useful, informative, even profitable site, and you'll find a wealth of online resources to help you find the best solutions. ▼

The 411 on CRM

These sites offer ideas and information about CRM.

CRM Forum *(www.crm-forum.com)* is a clearinghouse of sorts for CRM resources, featuring discussion forums, news and careers sections, daily articles, and a calendar of events.

CRMGuru.com *(www.crmguru.com)* offers newsletters, discussion groups, vendor reviews, and guides to getting started.

ITtoolbox CRM *(www.crmassist.com)* is a portal providing weekly newsletters, discussion groups, and a listing of CRM solution providers.

Microsoft bCentral *(www.bcentral.com)* offers Web-based subscription software for managing customer information, with an emphasis on sales. A monthly subscription to Customer Manager is $29.95, and you can try it for free. You'll also find topical articles and discussion forums.

SPARTAN TECHNOLOGIES, INC.

UPGRADES FOR THE NEXT MILLENNIUM

MOTHERBOARDS

ABIT www.abit-usa.com

SKU	CPU	PCI	ISA	AGP	MEM	STYLE	PRICE
ABVL6	SOCKET 370	5	1	1	3/168	ATX	$81
ABVH6-II	SOCKET 370	5	1	1	3/168	ATX	$89
ABVH6T	SOCKET 370	5	1	1+AMR	3/168	ATX	$95
ABKT7E	SOCKET A	6	1	1	3/168	ATX	$99
ABSL6	SOCKET 370	6		1+CNR	3/168	ATX	$114
ABBX133-RAID	SOCKET 370	5	1	1	3/168	ATX	$117
ABKT7A	SOCKET A	6	1	1	3/168	ATX	$117
ABSE6	SOCKET 370	6		1+CNR	3/168	ATX	$121
ABBE6II-RAID	SLOT 1	5	1	1	3/168	ATX	$122
ABSA6R	SOCKET 370	6		1+CNR	4/168	ATX	$124
ABKA7	SLOT A	6	1	1	4/168	ATX	$124
ABST6-RAID	SOCKET 370	6		1+CNR	3/168	ATX	$129
ABKT7	SOCKET A	6	1	1	3/168	ATX	$132
ABKT7A-RAID	SOCKET A	6	1	1	3/168	ATX	$136
ABSH6	SLOT 1	6		1+CNR	4/168	ATX	$137
ABVP6	DUAL 370	5		1	4/168	ATX	$142
ABKA7-100	SLOT A	6	1	1	4/168	ATX	$152
ABKT7-RAID	SOCKET A	6	1	1	3/168	ATX	$154
ABTH7-RAID	P4	5		1+CNR	4/RIMM	ATX	$167

ASUS www.asus.com

SKU	CPU	PCI	ISA	AGP	MEM	STYLE	PRICE
ASA7V-E-WOA	SOCKET A	6		1+AMR	2/168	MATX	$84
ASCUV4X	SOCKET 370	5	1	1	3/168	ATX	$107
ASCUV4X-C	SOCKET 370	5		1+AMR	2/168	ATX	$112
ASCUV4X-V	SOCKET 370	5	1	1+AMR	3/168	ATX	$112
ASCUSL2-C	SOCKET 370	6		1+2CNR	3/168	ATX	$112
ASCUBX-E	SOCKET 370	6		1	4/168	ATX	$116
ASA7PRO	SOCKET A	5		1+AMR	3/168	ATX	$122
ASCUSL2-CBP	SOCKET 370	6		1+CNR	3/168	ATX	$122
ASA7V133	SOCKET A	4		1+AMR	3/168	ATX	$130
ASCUSL2	SOCKET 370	6		1+2CNR	3/168	ATX	$137
ASA7V-WOA	SOCKET A	5		1+AMR	3/168	ATX	$142
ASCUV4X-D	DUAL 370	5		1	4/168	ATX	$151
ASA7A266	SOCKET A	4		1+AMR	2DDR/168	ATX	$152
ASP4T	P4	5		1	4/RIMM	ATX	$184
ASA7M266	SOCKET A	4		1+AMR	2/DDR	ATX	$185
ASCUV266	SOCKET 370	5		1+ACR	3/DDR	ATX	$229
ASCUV4X-DLS	DUAL 370	5		1	4/168	ATX	$317
ASP3CD	DUAL SLOT 1	5		1	3/RIMM	ATX	$362
ASCUR-DLS	DUAL 370	7		ASMS	4/168	ATX	$669

intel www.intel.com

SKU	CPU	PCI	ISA	AGP	MEM	STYLE	PRICE
IND815EEA	SOCKET 370	5		CNR	3/168	ATX	$126
IND815EEA2L	SOCKET 370	5	LAN		3/168	ATX	$129
IND850GB	P4	5		1	4/RIMM	ATX	$169
IND850GBAL	P4	5	LAN	1	4/RIMM	ATX	$189

MSI www.msicomputer.com

SKU	CPU	PCI	ISA	AGP	MEM	STYLE	PRICE
MICK7TPRO-100	SOCKET A	6		1	3/168	ATX	$89
MICK7TTURBO	SOCKET A	6		1+CNR	3/168	ATX	$103
MIC815EPRO	SOCKET 370	6		CNR	4/168	ATX	$104
MICK7TTURBOLTD	SOCKET A	6		1+CNR	3/168	ATX	$114
MICK7TTURBO-R	SOCKET A	6		1+CNR	3/168	ATX	$116
MICPRO266MSTR	SOCKET 370	5		1+CNR	3DDR/168	ATX	$117
MIC815EPPROR	SOCKET 370	6		1+CNR	4/168	ATX	$122
MICPR266MSTR-R	SOCKET 370	5		1+CNR	3DDR/168	ATX	$127
MICK7T266PRO	SOCKET A	5		1+CNR	3/DDR	ATX	$142
MICK7MASTER	SOCKET A	5		1+CNR	2/DDR	ATX	$143
MIC850PRO	P4	5		1+CNR	4/RIMM	ATX	$166
MICK7TMASTER	SOCKET A	6		1+CNR	4/168	ATX	$244
MICK7MASTER-S	SOCKET A	5		1+CNR	2/DDR	ATX	$279

GIGA-BYTE www.giga-byte.com

SKU	CPU	PCI	ISA	AGP	MEM	STYLE	PRICE
GBGA-7IXE4	SOCKET A	5	2	1	3/168	ATX	$74
GBGA-6VXE+	SLOT 1	5	2	1	3/168	ATX	$81
GBGA-6VXE7+	SOCKET 370	5	2	1	3/168	ATX	$81
GBGA-7IXE	SLOT A	5	2	1	3/168	ATX	$81
GBGA-6VA7+	SOCKET 370	4	2	1	3/168	AT	$82
GBGA-6VX7-4X	SOCKET 370	5	1	1	3/168	ATX	$89
GBGA-7ZM	SOCKET A	3		1+AMR	3/168	MATX	$96
GBGA-7ZX-1R5	SOCKET A	5		1+AMR	3/168	ATX	$101
GBGA-7ZX	SOCKET A	5	1	1+AMR	3/168	ATX	$102
GBGA-7ZX-1	SOCKET A	5	1	1+AMR	3/168	ATX	$102
GBGA-7ZXR5	SOCKET A	5	1	1+AMR	3/168	ATX	$107
GBGA-7ZXR	SOCKET A	5	1	1+AMR	3/168	ATX	$112
GBGA-7DXC	SOCKET A	5		1+AMR	2DDR	ATX	$137
GBGA-7DX	SOCKET A	5		1+AMR	2DDR	ATX	$147
GBGA-6VXD7	DUAL 370	5	1	1	4/168	ATX	$147
GBGA-8TXC	P4	5		1+CNR	4/RIMM	ATX	$174
GBGA-8TX	P4	5		1+CNR	4/RIMM	ATX	$184
GBGA-7DXR	SOCKET A	5		1+AMR	3DDR	ATX	$187

CPU'S

ALL CPU'S HAVE A 1 YEAR WARRANTY WHEN PURCHASED WITH A CPU FAN.

intel www.intel.com

INTEL CELERON-A FCPGA	600MHZ	128K	$41
INTEL CELERON-A FCPGA	633MHZ	128K	$42
INTEL CELERON-A FCPGA	667MHZ	128K	$47
INTEL CELERON-A FCPGA	700MHZ	128K	$54
INTEL CELERON-A FCPGA	733MHZ	128K	$56
INTEL CELERON-A FCPGA	766MHZ	128K	$57
INTEL CELERON-A FCPGA	800MHZ	128K	$72
INTEL CELERON-A FCPGA	850MHZ	128K	$74
INTEL CELERON-A FCPGA	900MHZ	128K	$92
INTEL PENTIUM III 133MHZ BUS	667MHZ	256K FCPGA	$87
INTEL PENTIUM III 100MHZ BUS	700MHZ	256K FCPGA	$104
INTEL PENTIUM III 133MHZ BUS	733MHZ	256K FCPGA	$105
INTEL PENTIUM III 100MHZ BUS	750MHZ	256K FCPGA	$106
INTEL PENTIUM III 100MHZ BUS	800MHZ	256K FCPGA	$129
INTEL PENTIUM III 100MHZ BUS	850MHZ	256K FCPGA	$139
INTEL PENTIUM III 133MHZ BUS	800MHZ	256K FCPGA	$129
INTEL PENTIUM III 133MHZ BUS	866MHZ	256K FCPGA	$139
INTEL PENTIUM III 133MHZ BUS	933MHZ	256K FCPGA	$164
INTEL PENTIUM III 133MHZ BUS	1000MHZ	256K FCPGA	$184
INTEL PENTIUM III 133MHZ BUS	667MHZ	256K SECC	$78
INTEL PENTIUM III 100MHZ BUS	700MHZ	256K SECC	$89
INTEL PENTIUM III 133MHZ BUS	733MHZ	256K SECC	$91
INTEL PENTIUM III 100MHZ BUS	750MHZ	256K SECC	$84
INTEL PENTIUM III 133MHZ BUS	800MHZ	256K SECC	$122
INTEL PENTIUM III 100MHZ BUS	800MHZ	256K SECC	$127
INTEL PENTIUM III 100MHZ BUS	850MHZ	256K SECC	$137
INTEL PENTIUM III 133MHZ BUS	866MHZ	256K SECC	$142
INTEL PENTIUM III 133MHZ BUS	933MHZ	256K SECC	$147
INTEL PENTIUM III 133MHZ BUS	1000MHZ	256K SECC	$194
INTEL PENTIUM III 100MHZ BUS	1000MHZ	256K SECC	$195
INTEL PENTIUM 4 400MHZ BUS	1300MHZ	256K SOCKET423	$149
INTEL PENTIUM 4 400MHZ BUS	1400MHZ	256K SOCKET423	$152
INTEL PENTIUM 4 400MHZ BUS	1500MHZ	256K SOCKET423	$159
INTEL PENTIUM 4 400MHZ BUS	1700MHZ	256K SOCKET423	$309
INTEL PENTIUM 4 400MHZ BUS	1800MHZ	256K SOCKET423	$369

AMD www.amd.com

AMD K6 II W/3D NOW	100 MHZ BUS	P450MHZ	$28
AMD K6 II W/3D NOW	100 MHZ BUS	P500MZ	$33
AMD K6 II W/3D NOW	100 MHZ BUS	P550MHZ	$38
AMD K6 III W/3D NOW	100MHZ BUS	P400MHZ	$44
AMD DURON	200 MHZ BUS	P700MHZ	$27
AMD DURON	200 MHZ BUS	P750MHZ	$28
AMD DURON	200 MHZ BUS	P800MHZ	$39
AMD DURON	200 MHZ BUS	P850MHZ	$47
AMD DURON	200 MHZ BUS	P900MHZ	$54
AMD DURON	200 MHZ BUS	P950MHZ	$79
AMD K7 SLOT A TBIRD	200 MHZ BUS	P850MHZ	$83
AMD K7 SLOT A TBIRD	200 MHZ BUS	P900MHZ	$99
AMD K7 SOCKET A TBIRD	200 MHZ BUS	P850MHZ	$62
AMD K7 SOCKET A TBIRD	200 MHZ BUS	P900MHZ	$67
AMD K7 SOCKET A TBIRD	200 MHZ BUS	P950MHZ	$69
AMD K7 SOCKET A TBIRD	200 MHZ BUS	P1000MHZ	$79
AMD K7 SOCKET A TBIRD	266 MHZ BUS	P1000MHZ	$77
AMD K7 SOCKET A TBIRD	200 MHZ BUS	P1100MHZ	$82
AMD K7 SOCKET A TBIRD	266 MHZ BUS	P1133MHZ	$89
AMD K7 SOCKET A TBIRD	200 MHZ BUS	P1200MHZ	$89
AMD K7 SOCKET A TBIRD	266 MHZ BUS	P1200MHZ	$92
AMD K7 SOCKET A TBIRD	200 MHZ BUS	P1300MHZ	$124
AMD K7 SOCKET A TBIRD	266 MHZ BUS	P1333MHZ	$125
AMD K7 SOCKET A TBIRD	266 MHZ BUS	P1400MHZ	$149
AMD K7 SOCKET A TBIRD	200 MHZ BUS	P1400MHZ	$149
AMD SOCKET A PALOMINO	266 MHZ BUS	P1000MHZ	$204
AMD SOCKET A PALOMINO	266 MHZ BUS	P1200MHZ	$229
AMD SOCKET A PALOMINO	266 MHZ BUS	P1400MHZ	$269

SOUND CARDS

CREATIVE www.creative.com

CLCT4815	SOUND BLSTR PCI ES4815 OEM	$20
CLSB4525	SOUND BLSTR ISA 16 WAVE FX RETAIL	$20
CLCT4520	SOUND BLSTR AWE 64 ISA OEM	$24
CLCT4750	SOUND BLSTR PCI 128 OEM	$31
CLCT4832	SOUND BLSTR LIVE VALUE PCI OEM	$45
CLSBLIVE5.1OE	SOUND BLSTR LIVE OEM	$61
CLSBLXG5.1R	SOUND BLSTR LIVE X-GAMER RETAIL	$89
CLSBLMP3+5.1R	SOUND BLSTR LIVE MP3+ RETAIL	$89
CLSBLPLAT5.1R	SOUND BLSTR LIVE PLATINUM RET	$175

MEMORY

72-PIN EDO

16MB	4X32 EDO	60NS	$9
32MB	8X32 EDO	60NS	$18
64MB	16X32 EDO	60NS	$26
128MB	32X32 EDO	60NS	$109

168-PIN LONG DIMMS EDO

64MB	8X64	60NS 3.3VOLT	$77
64MB	8X72 (unbuffered)	60NS 3.3VOLT ECC	$67
64MB	8X72 (buffered)	60NS 3.3VOLT ECC	$67
128MB	16X64	60NS 3.3VOLT	$152
128MB	16X72 (unbuffered)	60NS 3.3VOLT ECC	$134
128MB	16X72 (buffered)	60NS 3.3VOLT ECC	$117
256MB	32X72 (buffered)	60NS 3.3VOLT ECC	$239

168-PIN LONG DIMMS SDRAM (66MHz)

32MB	4X64	10NS	$8
64MB	8X64	10NS	$12
128MB	16X64	10NS	$23

168-PIN SDRAM PC100/133/150

32MB	4X64	8NS	$8
64MB	8X64	8NS	$10
64MB PC133	8X64	7.5NS	$10
64MB	8X72	8NS	$12
128MB	16X64	8NS	$16
128MB PC133	16X64	7.5NS	$16
128MB PC150	16X64	7NS	$20
128MB	16X72	8NS	$18
128MB PC133	16X72	7.5NS	$19
256MB	32X64	8NS	$33
256MB PC133	32X64	7.5NS	$33
256MB PC150	32X64	7NS	$37
256MB	32X72	8NS	$41
256MB PC133	32X72	7.5NS	$42
512MB	64X72	8NS	$99
512MB PC133	64X64	7.5NS	$99
512MB PC133	64X72	7.5NS	$104
1024MB PC133	128X72	7.5NS	$359

DDR RAM PC1600/2100

128MB	16X64	200MHZ	$25
128MB	16X64	266MHZ	$25
128MB	16X72	200MHZ	$29
128MB	16X72	266MHZ	$29
256MB	32X64	200MHZ	$47
256MB	32X64	266MHZ	$47
256MB	32X72	200MHZ	$56
256MB	32X72	266MHZ	$56
512MB	64X72	266MHZ	$329

WE CARRY RAMBUS MODULES AND CORSAIR MICRO BRAND MEMORY

VIDEO CARDS

matrox www.matrox.com

MATG45016SDR	G450 16MB, SDR AGP OEM (DUAL)	$65
MATG45016DDR	G450 16MB, DDR AGP OEM (DUAL)	$68
MATG45032DDR	G450 32MB, DDR AGP OEM (DUAL)	$87
MATG45032DDRBOX	G450 32MB, DDR AGP RET(DUAL)	$119
MATMARG45032A	MARVEL G450 32MB, DDR AGP OEM	$179

ATI www.atitech.com

ATIX200032A	EXPERT 2000 AGP OEM VER 32MB	$39
ATIX2KPRO32A	EXPERT 2000PRO AGP OEM VER 32MB	$46
ATIRFPRO32ATV	RAGE FURY PRO AGP OEM 32MB W/TV	$64
ATIRADLE32A	RADEON LE AGP OEM 32MB DDR	$75
ATIRADVE32A	RADEON VE AGP OEM 32MB DDR DUAL	$79
ATIRFMAX64	RAGE FURY MAX AGP OEM 64MB	$99
ATIAIWPRO32A	ALL-IN-WONDER PRO AGP OEM 32MB	$104
ATIRADEON64A	RADEON AGP OEM 64MB DDR	$159
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TOSDR1102KIT	8X8X8X32	ATAPI	140/105MS	256K	$179
TOSDW2002KIT	6X-24XDVDRAM	ATAPI	120MS	8192K	$429

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YACRW2200EZKIT	20X/10X/40X	ATAPI	160MS	8192K	$229
YACRW2100SZKIT	16X/10X/40X	SCSI	140MS	4096K	$229

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SYCRX160E/CHOEM	12X/8X/32X	ATAPI	150MS	4096K	$97
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NETWORKABLE

More and more road warriors are ditching their laptops for highly portable PDAs. These solutions can help keep traveling staffers connected in a mobile world.

Mobile Productivity Is at Hand

by Richard Santalesa

Linking remote employees to company resources, never a walk in the park for IT managers, is easier than ever, thanks to the expanding range of options for PDAs and other handheld devices. But this wealth of options makes selecting the best one difficult, and additional complexity is ever the bane of IT's frazzled existence.

"From a CIO's perspective, the dream is to tell employees they can have any mobile connection, as long as it's black," jokes Jacob Christfort, chief technology officer and vice president of product development for OracleMobile, alluding to Henry Ford's famous quip regarding the Model T's limited color schemes.

Standardization reduces complexity, maintenance, and costs for implementation and support; increases purchasing power; and, in some cases, even improves reliability. Unfortunately, most companies don't have the luxury.

"Corporations are not standardizing on one device," says Mark Willnerd, a product marketing manager for Extended Systems' mobile data management division. "They have to support many different handhelds." Indeed, by 2004, 60 percent of office workers will carry at least three mobile computers or devices, according to the research firm Gartner.

Although ensuring different PDAs connect smoothly to your company data is complicated, it isn't as overwhelming as it sounds. It basically boils down to connecting no more than three families of devices. According to Dataquest, of the 12 million PDAs shipped worldwide (9 million of those shipped in 2000), 88 percent are powered by only three operating systems: the Palm OS, Windows CE/Pocket PC, and the Symbian OS (formerly EPOC). The Palm OS holds the lion's share at 63 percent, Microsoft's various handheld operating systems make up 20 percent, and Symbian comes in a distant third with 5 percent.

The rest of 2001 promises a PDA shake-up, according to Sarah Kim, a wireless/mobile technologies analyst for the Yankee Group. "Manufacturers have huge excess-inventory issues," she says. The result will be a buyer's market as prices continue to be slashed, particularly at Palm and Handspring. Compaq's premium iPaqs, however, remain in tight supply.

CHOOSING A HANDHELD

Regardless of who holds the IT authority at your company, the decision on which handhelds to support may have already been made—by your employees. The first thing to do is poll users who need remote connectivity about the types of PDAs they're already using. Your users probably have either Palm OS- or Pocket PC-based PDAs—other products such as the popular RIM BlackBerry wireless e-mail device are primarily corporate, rather than consumer, purchases—so you'll likely end up supporting one of the two. If only a handful of employees are using Pocket PCs, for instance, and you can't find a compelling reason to switch the others to this platform, you should probably convert your Pocket

PC people to the Palm OS. Both platforms support wireless connectivity and expansion slots. (See the sidebar, "Face Time With the Handhelds.")

Palm OS-based PDAs from Palm and Handspring are the clear front-runners in the handheld race, and for good reason. The Palm OS is simple to use, and more than 145,000 registered developers have written countless applications spanning everything from e-mail to wireless connectivity to corporate and vertical solutions. The newest Palm PDAs—the slim m500 and m505—are its first models to include an expansion-card slot, a welcome and overdue addition. The slot supports both Secure Digital and MultiMediaCard cards, and the new m50x Palms include a copy of Chapura's PocketMirror 3.0 and DataViz's excellent Documents To Go 3.0 software. These two applications finally put the Palm on a level with Pocket PC PDAs in terms of syncing with Outlook and editing Word and Excel documents.

Other interesting Palm-based handheld options have recently hit the street, such as the Kyocera QCP 6035 Smartphone *(www.kyocera-wireless.com/kysmart)*, which combines an 8MB Palm with a trimode phone supporting CDMA PCS, CDMA cellular, and analog service. (See "The Happy Reunion of Palm and Phone," August, p. 82.)

Handspring's Palm-based Visors have always included a Springboard expansion slot. At last count there were 35 shipping modules, including the $299.99 Presenter-to-Go, which connects to a digital projector for laptop-free presentations, and the $44.50 Memory Access Springboard Module, which combines 2MB of flash memory with a silent vibrating alert. There's also the $249 VisorPhone, which combines a wireless modem and cell phone.

At $19 to $49 per month for the average corporate plan, wireless access for handhelds isn't cheap. Palm is working on technology that should, in theory, hold down the price of wireless connections. The company's new hush-hush, integrated wireless device, scheduled for release by the end of this year, departs from its current wireless system to supply an always-on, packet-based link. Palm also plans to build its own wireless-service bureau that acts as a secure corporate data-redirect site. Using technology from Extended Systems, Palm plans to supply wireless connectivity for the most popular e-mail solutions, including Microsoft Exchange and Lotus Notes. Palm will also resell the company's XTNDConnect Server software as a Palm-branded product by the end of the year.

As for the Pocket PC platform, Microsoft considers it a crucial part of its .Net and mobility strategy, which includes support for Stinger, its upcoming OS for cell phones and PDA/phone devices. The product is almost ready for release, but its success depends on how many phone companies decide to support it. Microsoft recently introduced its Mobile Information Server, which promises built-in support for Outlook Mobile Access, to give remote users access to their e-mail, contacts, calendars, tasks, and intranet business applications. The company has already posted beta versions of its Mobile Internet Toolkit for developers as a free download.

Also in the works is the next version of the Windows CE OS (Pocket PC's core), code-named Talisker, which, according to Microsoft's publicized schedule, will hit the street at the end of this year. But given Microsoft's track record in releasing OSs, knowledgeable sources don't expect the next Windows CE OS to surface until closer to 2003. Talisker adds useful features including more security protocols and support for the Bluetooth wireless standard.

Until then, the Pocket PC's most significant payoff is its native support for Microsoft apps and file formats, such as Outlook, Excel, and Word. Although its Windows heritage adds complexity, and demands significantly more memory and CPU horsepower—translating to higher prices and shorter battery life—this heritage also allows documents to flow back and forth from desktops to handhelds with a minimum of fuss. Pocket PCs are also unmatched in Web and multimedia support, with many able to record and play music files, display e-books, and play movie clips and other forms of rich media straight out of the box. Their color displays are also brighter and sharper than those on Palm devices.

At heart, the battle between Palm and Pocket PC handhelds boils down to a difference in philosophy. The Palm OS's strength is its simplicity, small size, and focus on the fundamentals. The Microsoft Pocket PC OS's strength lies in its complexity, which provides for a multitude of features and seamless connectivity to Windows and Windows applications.

ILLUSTRATION BY BEK SHAKIROV

SOFTWARE SOLUTIONS

Once you know which PDAs your road warriors are using, determine what they need them for (for example, e-mail, sales-force automation, supply-chain management) and what data they need access to (sales and marketing figures, financial information). Without a doubt, remote and wireless e-mail is the killer app for corporate PDAs, but access to enterprise data is a close second.

All the units come preloaded with basic applications—to-do list, calendar, address book, some mail connectivity, memo pad—but none is of any real value for corporate connectivity. Here are only a few of the most notable solutions, from companies with proven track records in mobile connectivity, most of which provide wireless support.

((●)) **AvantGo** *(www.avantgo.com)*: Today, Ford employees have a much easier time staying in touch on the road than they did

when the Model T was the rage. With AvantGo's mobile-sync solution on their Palms or Pocket PCs, they gain access to the company data they need. Although handhelds include syncing software for their own applications, AvantGo sets up what Palm calls a "conduit," or mobile link, to handle a third-party application's specific syncing chores. It behaves similarly on Pocket PCs.

Another avid AvantGo client is networking powerhouse Cisco Systems, which was able to deploy AvantGo in a matter of weeks, according to Robert Meinhardt, AvantGo's vice president of enterprise marketing. Cisco uses AvantGo to enhance customer-relationship management and keep its thousands of field salespeople current with product information sent directly to their Palm or Pocket PC handhelds, either wirelessly via AvantGo's M-Business Server or via regular AvantGo sync operations. To handle groupware syncing, AvantGo's mobile engines tie into Microsoft Outlook or Lotus Notes. Even small businesses can use AvantGo; the free client lets you sync Web content from more than 1,700 sites or create your own sync "channels" of any site.

((●)) **Extended Systems** ***(www.extendedsystems.com)*****:** Extended Systems was one of the first to do wireless syncing. Companies running any handheld OS—be it Palm, Windows CE, Pocket PC, or Symbian—can call on the company's solutions. Its software provides mobile access on three fronts: remote syncing through its XTNDConnect Server; real-time wireless e-mail access (Exchange, ODBC sources, Lotus Domino, IMAP4/POP3) via XTNDConnect View; and Remote Procedure Middleware (RPM) linkage through its XTNDConnect RPM software, which connects mobile devices to corporate servers.

((●)) **Intellisync Anywhere 2.0** ***(www.pumatech.com)*****:** Pumatech has long been a pioneer in the data-syncing market, with an entire suite of mobile application platform (MAP) syncing products for handhelds and corporate servers. Its newest release, Intellisync Anywhere 2.0, adds remote access to Lotus Domino R5, and the company was set to unveil a version for Microsoft Exchange by the time you read this. Intellisync Anywhere 2.0 adds support for Pocket PCs and a handy SMS feature to send alerts to pagers and phones. It extracts user info into a "shadow file" that's then used to sync a user's handheld, keeping additional traffic on the server to a minimum.

Pumatech also provides a free remote-sync-backup and Web service called Intellisync.com. It lets anyone sync Palm and Pocket PC handheld information between work and home. The site also offers a downloadable Web browser called Browse-it, which, like AvantGo, lets you clip and carry Web sites.

((●)) **SureWave Mobile Server** ***(www.jpmobile.com)*****:** JP Mobile has focused exclusively on the wireless enabling of enterprise applications since 1995. Its flagship product is SureWave Mobile Server. "It's a scalable, secure Java 2 Platform Enterprise Edition system that gives wireless access to company data for pretty much every handheld or device," says Farlin Halsey, vice president of marketing. SureWave's long list of compatible devices bears Halsey out. The SureWave Mobile Server (either hosted by JP Mobile or running on Solaris, Linux, or Windows NT servers in your data center) supports BlackBerry, Motorola, and Glenayre pagers; Palm, Symbian, and Pocket PC handhelds; and any WAP phone. To tap into enterprise Web sites, e-mail, calendars, addresses, and memos (using Lotus Notes and Microsoft Exchange), JP Mobile sells two "ready-to-go" add-ons for its Mobile Server: SureWave Mail and SureWave Web.

((●)) **Audible** ***(www.audible.com)*****:** Known for secure, downloadable audio books and other programs, Audible now offers an enterprise solution that lets employees download and listen to enterprise training, briefs on competitors' products, or anything else you choose to offer. "Audible-Ready" players include Pocket PC PDAs such as models in Casio's Cassiopeia, HP's Jornada, and Compaq's iPaq lines. Microsoft's sales and mobile service force currently uses the Drive Time Audible service to tap into product-manager and sales-strategy briefings on the road, according to David Simpson, Audible's director of business development. Audible has also publicly demonstrated forthcoming wireless streaming to Pocket PCs and phones.

For vertical-industry remote handheld solutions, Wysdom ***(www.wysdom.com)*** specializes in sending real-time alerts by wireless e-mail and SMS for billing systems, user security management, and other, similar situations through its MAP server. And software giant Oracle ***(www.oracle.com)*** is building a wireless edition of its Oracle9i Application Server (Oracle9iAS) to provide corporate system access from any handheld WAP phone or PDA with a microbrowser.

Before you look into any of these solutions, limit yourself to what your organization really needs and stay within these boundaries to avoid wasting IT staff time, money, and energy. Keep your users in the loop on what you intend to achieve, and in short order your company's handhelds will be buzzing with e-mail and data previously reserved for desktops and laptops. ▼

Face Time With the Handhelds

Here's a look at what some wireless-capable handheld devices offer.

	Model	Memory	Color	Expansion Slot	Price
Palm OS	**Handspring** *www.handspring.com/products/visorfamily*				
	Visor Prism	8MB	Yes	Springboard	$399
	Visor Edge	8MB	No	Springboard	$399
	Visor Platinum	8MB	No	Springboard	$249
	Visor Deluxe	8MB	No	Springboard	$199
	Visor	2MB	No	Springboard	$149
	Kyocera Wireless *www.kyocera-wireless.com/kysmart*				
	QCP 6035 Smartphone*	8MB	No	None	$499.99 to $525
	Palm *www.palm.com/products/family.html*				
	m505	8MB	Yes	MultiMediaCard/ Secure Digital	$449
	m500	8MB	No	MultiMediaCard/ Secure Digital	$399
	VIIx*	8MB	No	None	$199
	Vx	8MB	No	None	$299
	IIIxe	8MB	No	None	$179 to $259
Pocket PC OS	**Casio** *www.casio.com/personalpcs*				
	Cassiopeia E-125	32MB	Yes	CompactFlash	$499
	Cassiopeia E-115	32MB	Yes	CompactFlash	$400
	Cassiopeia EM500	16MB	Yes	MultiMediaCard/ Secure Digital	$399.99
	Compaq *www.compaq.com/products/handhelds/pocketpc*				
	iPaq H3670	64MB	Yes	CompactFlash	$649
	iPaq H3650	32MB	Yes	CompactFlash	$499
	iPaq H3635	32MB	Yes	CompactFlash	$599
	iPaq H3150	16MB	No	CompactFlash	$299
	Hewlett-Packard *www.hp.com/jornada*				
	Jornada 548	32MB	Yes	CompactFlash	$449.99
	Jornada 547	32MB	Yes	CompactFlash	$380 to $525
	Jornada 540	16MB	Yes	CompactFlash	$426.99 to $499
	Jornada 525	16MB	Yes	CompactFlash	$359
	Jornada 520	16MB	Yes	CompactFlash	$359
BlackBerry OS	**Research In Motion** *www.rim.net/products/handhelds/specifications/*				
	857/957 Wireless Handheld*	5MB	No	None	$499 (with monthly service of $19 to $49)
	850/950 Wireless Handheld*	4MB	No	None	$399 (with monthly service of $19 to $49)

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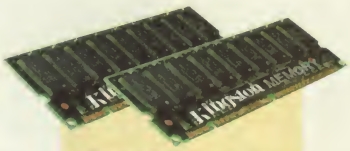

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ALICE & BILL

The Hard Edge

BY ALICE HILL AND BILL O'BRIEN

Microsoft Office XP's Costly Phone Call; Serial Adapters Come Back; and Are Cell Phones Killing Us?

SEPTEMBER HERALDS THE MARCH OF TINY FEET BACK TO THE classroom. In California, it's the time of year when thousands of moderately affluent American citizens leave the country, denounce their citizenship, and sneak back in illegally so they can send their kiddies to schools they couldn't otherwise afford were it not for the fact that the children of "undocumented immigrants" are educated on the taxpayer's dollar. In the rest of the country, the migration of bug-eyed computing types back to institutes of learning leaves a big ol' vacuum among the programming, installation, and technical-support staffs at many companies—at least until spring break.

CELL PHONES: KILLING ME SOFTLY?

When Alice lived in New York, she would regularly see a woman camped in front of her subway station wearing a bulging ski cap easily twice the size of her head. A report on the local news one night explained this mysterious condition: She was a "foil head." According to the report, people like the woman Alice saw believed surrounding the head with aluminum foil would protect them from the harmful radiation they could feel piercing their brains from nearby TV broadcasting stations and radio antennas.

Alice mentions foil heads because the hysteria surrounding cell-phone radiation is reaching a point where she's convinced people are ready to break out the aluminum foil if they thought it would ward off the radiation they swear is piercing their brains. (Have you seen Bill's head lately?!) Which got Alice thinking: Are we in danger when we use our cell phones, or is fearing radiation as crazy as packing a ski cap with foil?

Here's what Alice does know. Cell phones produce radio frequency (RF) radiation in the microwave band. At high levels, this can cause biological damage from the heat produced—much like a microwave oven. What no one knows is whether damage occurs at low RF levels.

Although it's true foil and microwaves don't mix, Alice wouldn't advise rummaging for the Reynolds Wrap yet. Last fall, the FCC created a measurement called Specific Absorption Rate (SAR) to give consumers data on the radiation levels their phones produce. Based on current test data, the Ericsson KF788 was in first place as the highest SAR-level phone on the market (1.56 SAR). The lowest SAR-rated phone is the Qualcomm pdQ 1900 (0.2634 SAR). You can look up your own phone's rating at the cellular-phone-radiation-data Web site, ***www.sardata.com.***

The good news is all three of the government agencies charged with studying electromagnetic fields and cell-phone safety (the Federal Communications Commission, the Food and Drug Administration, and the Occupational Safety and Health Administration) as well as the independently run Institute of Electrical & Electronics Engineers have concluded that all cell phones made today fall under acceptable levels of radiation, providing you don't hold them against your brain for more than an hour at a time.

Although the jury is still out on what the real dangers are, here are some things the FDA recommends you do right now to protect yourself. When using a phone in your car, use one that has an antenna outside the vehicle. Or use a headset with a remote antenna connected to a mobile phone carried at the waist.

Bottom line: Continuous talk time seems to be the biggest threat, so better be safe than sorry. If you press a phone to your head for long periods of time, keep your calls under an hour and get a headset. They look a lot better than ski caps.

WHY ASK WHY?

TC Computers ***(www.tccomputers.com)*** is practically an icon for those of us who are throwbacks to the days when a computer was several boxes of parts, and software installation involved a screwdriver. It's also a division of Insight ***(www.insight.com)***, once the place to go for the best prices on hard drives, and now a multiproduct corporate giant that sells just about everything.

So there was Bill, hunting down parts for a possible 1.7GHz Pentium 4 system when he came upon an Intel D850GB motherboard. (All right, the Asus P4T wasn't in stock, and the P4T-M wasn't ready yet, so calm down.) At TC, the motherboard goes for $183.99; at Insight it's $208.99. Huh? Guys?

All right, different divisions can have different prices. It's done all the time. But TC's going price for a 1.7GHz P4 was $407. (Remember, this is "Hard Edge" time. That price may well have changed between now and now.) But if you were willing to buy a boxed 1.7GHz P4 that includes 128MB of <spit> RDRAM, you could have it for $499.99. Going back to third-year college math, that's $92.99 for the 128MB RDRAM module. Nifty price. But if you buy a boxed 1.7GHz P4 that includes 256MB of <spit> RDRAM, you're going to pay $649.99 at TC. Again using higher-learning math skills, the extra 128MB of RDRAM is $150. Huh? Guys?

Bill's sure there's some gosh-darn logical

ILLUSTRATION BY DENNIS HARMS

explanation for all this price confusion. In fact, he can point to one possibility immediately: For purveyors of practically everything in computing at attractive pricing, TC Computers has a frelling sloppy Web site. Why say such a thing? Bill bought a MicroStar (MSI) DDR/Pentium III motherboard from TC that, when it arrived at the Basement of Doom and Pepsi-Cola, was missing a few items the Web-site specifications said it would have (namely, integrated RAID 0 and NIC support). Oh, sure, according to MSI, a version of the motherboard existed that didn't include the extra items, but Bill didn't receive that one, and TC didn't sell it. Bill could have returned the motherboard for a refund, but that's not the point. TC is the mecca of motherboards. But it has to start getting it right.

Is the problem limited to TC? No. Bill placed an order with Buy.com *(www.buy.com)* on a Saturday night. (Those of you who suspect Bill gets all his stuff for free should, by now, be properly chastised.) He canceled all three items on Sunday, and on Wednesday, two arrived at the BofD&PC. Excellent timing for both shipping and handling an order, but—huh? Guys? (Here too, Bill had the option of returning the items, although there was some initial confusion about how that should happen.)

Point is, these are two of the big guns in Bill's arsenal of "Hey, I need something odd, cheap, and right now" places. (Believe it or don't, but Dell's factory outlet, *www.dell.com/us/en/dfh/default.htm*, is another place for good weird deals.) But it's not enough just to have an e-commerce site. The site must be maintained accurately. And order processing must be handled efficiently, and that includes cancellations. Handling problems nicely after the fact just isn't enough. They need to prevent the problems from occurring in the first place.

NOTE TO SELF

When Intel finally pushes out its smaller-die-size Pentium 4, it would be really dumb to have it arrive as a 1.7GHz model. Owners of older, 1.7GHz phat Pentium 4s will have something to compare their chips to, and they'll become angry that their same-speed processors are slower. It will also cause marketing angst (and maybe some skulldug-gery), similar to what AMD faced with its Athlon Thunderbird and Athlon Classic before it wisely yanked the Classic.

Don't buy a Pentium 4 computer or motherboard until the smaller version shows up, because you'll be stuck with a useless nonupgradable motherboard the minute Intel kills the phat P4s, in the same way Athlon Classic owners were left in the lurch. (Hi, Bill!)

GET OFF OF MY CLOUD

If you don't know about it already, Microsoft's new Office XP suite of applications requires you to activate the software via phone or Internet sometime during the first 50 uses, or the software will die on you.

Bill wants to know what the deal is. In all the years he's been using Word (having been dragged away from WordStar, a superior word processor by all accounts, even with its lack of a GUI), he's never needed any follow-up (which some folks call "help") from Microsoft. Have you ever tried to get any follow-up from Microsoft?

Message to Ballmer: Hey! You! Get off of my cloud! This activation stuff stinks to high heaven.

"So why does Microsoft want to stick its ugly cloud-filled head inside my computer if I use XP?" Bill queried in a paranoid voice. "And how does it tie in with the arrival of the Pentium's unique serial number of not-too-long ago?"

If we're using Microsoft's software, we're doing Microsoft a favor, not vice versa. Message to Ballmer: Hey! You! Get off of my cloud! This activation stuff stinks to high heaven. Microcomputers were made popular by people who rejected the regimentation and intrusive environment of the mainframe office. You're messing with the primal forces of the personal-computer universe.

NOT QUITE MONDO COOL, BUT CHILLIN'

Keyspan is a bank, right? Well, maybe not, but it is the name of a peripheral manufacturing company *(www.keyspan.com)* that's recently released two devices. The first is a USB to four-port serial adapter. Yawn, yes? No. If you're like Bill's neighbor, Captain Bob, it's an answer to a prayer. There sat the captain in front of his Dell Dimension with a single serial port on the back of the box and, in his hands, a serial adapter for his digital camera, a serial adapter for his PDA, and a serial adapter for his labeling machine. Three into one just doesn't go very well unless you're doing a lot of plugging and unplugging and, even then, assigning multiple devices to a single interrupt can bring on the blue screen of death in a heartbeat. Even you Linux guys should be up cheering. Keyspan's four-port serial adapter supports Kernel 2.4.

The other device is more interesting but less useful right now. (See? Alice and Bill don't just give Mondo Cool awards to brainy children. They have to have a job, as well.) It's a USB 2.0 card that gives you four external USB ports and one internal port. Imagine how much more versatile it would be if you could hook up an internal CD-RW to an internal USB port. No hassling with IDE cables or master/slave jumpers. A 480mbps data-transfer speed. Have we mentioned you can connect up to 127 devices to a USB port?

But here's the rub: The board is both Mac- and Wintel-compatible (sorry, Linux guys), but only at USB 1.1's slower transfer rate until Apple adds 2.0 support to the Mac OS or Microsoft adds it to Windows (probably with XP). There's no need to rush, however. There aren't any USB 2.0-compatible devices yet, and we don't see anyone making any overt moves to have that happen in the USB arena until much before the holiday season. (The Keyspan card is USB 1.1 backward-compatible, as well.) In the meantime, Keyspan also has IEEE 1394 (FireWire) adapters in both PCI and PC Card flavors if you're looking for a fast fix.

DID YOU FORGET?

Aren't you forgetting something? Last month, Alice and Bill celebrated nine hard years of writing "The Hard Edge," and they still haven't heard from you. It's not too late to show how much you've enjoyed their biting wit and edgy technical insights by showering them with fabulous prizes (or at least a crummy e-mail). So drop what you're doing, rush to your computer, and send off your thanks, or better still, drop them a real line on paper with a generous cash contribution. Then get ready for year 10. It's going to be the best one yet.

Alice and Bill, Happy Nine Years
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370TSSA-815EB,U-100MB,133Mhz FSB,Aduio......$129
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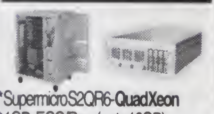

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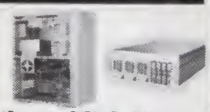

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*Adaptec7892Ultra-160,LVD
*18GB,10Krpm,Ultra-160MB
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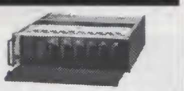

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*Mid-Towercase,w/300WP.S
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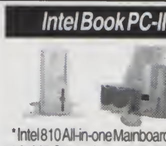
Intel Book PC-II



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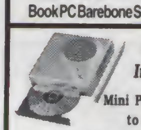
P3–667/750/800..........$519/$529/$549
P3-866/933/1G............$569/$579/$599
BookPCBareboneSystem..........$185



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STARTING FROM Scratch

by Sheldon Leemon

Restore your PC's performance and stability by reinstalling Windows and all your system software.

Anyone who owns a PC knows that, sooner or later, problems will develop. That's because every time you make a hardware or software change, there is the possibility that it will conflict or interfere with your existing setup and cause crashes.

If your system is seriously troubled, your best bet may be to save your important files to your backup device of choice, reformat your hard drive, and reinstall your software, program by program. A fresh start lets you pare your system down to the programs you really need, and install the latest versions of your applications and hardware drivers. It also can provide a great boost in performance and stability.

But make no mistake: Reformatting your hard drive and reinstalling Windows and all your applications is time-consuming, partly because you're sure to run into problems. For instance, you'll likely find yourself without a driver for some hardware component, or without the macros you created for your favorite application. You could find yourself still not quite back to normal a week or two weeks after your fresh start.

When starting over, most likely your biggest challenge will be remembering to save all the documents, data files, program preferences, and other information that you've accumulated. Nobody without firsthand knowledge of your system can give you a comprehensive list of what you need to save, but the step-by-step outline below should help you avoid the most-often-hit potholes.

1 MAKE A LIST

First, make sure that you have everything needed to replace system software. At the very least, you'll need:

- **A Windows installation CD.** Make sure it's a full version that will install on an empty drive, not an upgrade that requires a previous version to already be installed. You also need the registration number, usually found on the original jewel case. If your computer came with a restore CD that automatically reinstalls Windows and all preloaded applications, you can use that instead.
- **Driver software for any unusual hardware.** Windows includes drivers for most standard hardware, such as CD-ROM drives, sound cards, and graphics cards. It probably won't have the drivers for less common devices such as scanners or digital cameras, or for brand-new products. Make sure you have the software that came with the device or, better yet, download the most recent drivers from the manufacturers' Web sites, making sure to save them to a floppy disk or another drive that won't be reformatted.
- **Internet setup disks.** Some Internet service providers (ISPs) have an installation CD that makes it easy to re-establish your Internet connection; others simply provide step-by-step instructions on how to configure your connection. Either way, make sure you have what you'll need to reconnect.
- **Application installation CDs.** Remember the CDs you used to install your word processor, personal finance manager, CD burner, and photo-editing software? Now, remember where you put them.

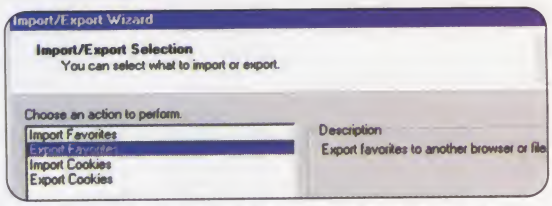
TIP: If you don't have the original installation disks for some of your software, you still may be able to reinstall by saving the applications with a transport utility such as those found in McAfee Uninstaller or Norton CleanSweep.

2 BACK UP VITAL DATA

If you have an easy way to make a complete system backup, now would be a good time to do so, just as insurance. Even if you don't, however, some things you absolutely must save to reinstall successfully.

Whatever you don't save will be gone forever after you reformat the drive. If you cannot make a full backup, plan to spend at least a few hours, or even a few days, seeking out files to save. What you need to save will depend on your specific software and file-keeping habits, but here are a few basics you shouldn't forget:

- **Documents you created.** Look through My Documents and other subdirectories on your hard drive for documents you created, including word-processing files, digital photographs, and personal finance records. If you need reminders of where your files might be stored, try starting each of your applications and looking at the location of the last few files you saved.
- **Documents your programs created.** Many programs automatically save information, such as your Internet bookmarks, address book, and filed e-mail. Make a point of investing the time and trouble to figure out how to back up this information. You may have to dig into program documentation for more information. Many browsers, for example, let you save a bookmark file to a designated location using an export function. (In Internet Explorer, choose File > Import and Export.) And don't forget files such as Dial-Up Networking settings, which you can back up by dragging the connection icon from the Dial-Up Networking window in My Computer to a floppy disk.
- **Logon IDs and passwords.** You've entered, and probably forgotten, a lot of data, but your computer has memorized it. The typical Internet connection, for example, requires that you know your account name, password, the ISP's dial-up phone number, names for mail and news servers, and possibly an IP address. Make a point of finding these and writing them down, even if you've backed up your Dial-Up Networking settings.



Save accumulated software customizations, such as browser favorites or bookmarks, before reformatting your hard drive.

TIP: If a floppy drive is your only backup option, you may want to use an archive/compressor program such as WinZip *(www.winzip.com)* to fit more information on each floppy or to enable the copying of one file across multiple volumes.

3 CREATE A STARTUP DISK

To ease reinstallation, create a floppy disk you can boot from before you reformat your hard drive. Windows makes it easy to create a startup disk from the Control Panel. Select Settings > Control Panel from the Start menu, then open the Add/Remove Programs window. You'll see three tabs at the top. Click Startup Disk, then the Create Disk button.

Before you use you this disk to format your hard drive, make absolutely sure that it properly configures your CD-ROM drive. Restart the computer with the startup disk in the floppy drive and

Alternative Care

Starting over may be the surest, most straightforward cure for what's ailing your system, but it's no quick fix. So before you start, try a couple of less drastic treatments.

Check the fan. If the fan on your computer's processor has died, fallen off (most are attached with clips), or slowed down due to accumulated crud, it will almost certainly cause erratic operation. Replacement fans can typically be had for $10 or so at any well-stocked computer/electronics store.

Clean the Registry. To weed out old Windows Registry entries that may be affecting system performance, try a cleaning program, such as those available from TweakFiles *(www.tweakfiles.com/registry)*.

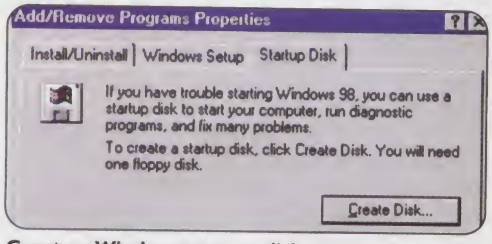
Slim down startup. The more programs that start automatically each time you turn on the computer, the more likely one of them will crash or two or more will conflict. Unless it's crucial that these programs start automatically, use the option settings to prevent them from doing so. If you're not sure which programs run automatically, you can use TFI Technology's StartStop *(www.tfi-technology.com/startstop.htm)* to identify them and to stop the ones that are unneeded.

Delete unnecessary software and hardware drivers. Complexity is the enemy of a smooth-running system. If you have software you no longer use or you have hardware drivers left over from devices you have removed, uninstall them using Add/Remove Programs from the Control Panel.

Perform regular maintenance. Use the Disk Defragmenter and ScanDisk in the System Tools folder on a regular basis. (The Maintenance wizard can help you set these up for automatic operation.) A regular system backup is a great idea, too.

Monitor CPU usage. If your system has slowed significantly, it could be that a runaway program is using processor power. TaskInfo 2000 *(www.iarsn.com)* can help identify which programs are hogging the CPU and eliminate them.

your Windows CD in the CD-ROM drive. When the floppy boot process finishes and you are left with a command prompt, type **Dir D:** (or the appropriate drive letter for your CD-ROM), and verify that you can read the contents of the Windows CD.



Create a Windows startup disk.

TIP: The startup disks created by some versions of Windows 95 don't include CD-ROM support. If your version doesn't configure your CD drive correctly, you may want to download a startup disk from an Internet site such as FixWindows.com ***(www.fixwindows.com/win95/cdboot.htm)***.

4 FORMAT THE HARD DRIVE

This step is simple, but there's no turning back: All the data on your hard drive will be wiped out. To format the drive, boot from the startup disk you created. Type **Format C:/s** when the command prompt comes up.

You'll be reminded that this step wipes out all your data, and you'll be prompted to agree. Do so, and the formatting starts. The process may take several minutes, depending on the size of your hard drive. When it finishes, you'll have the proverbial "clean slate."

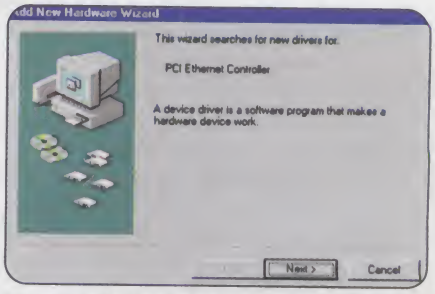
TIP: Before you format, you may wish to rethink your partitioning strategy. If you have a 20GB or larger hard drive, for example, you can create one partition (the C: drive) of 1GB to 2GB for Windows system files, and another larger partition (the D: drive) for program and data files. This isolates the Windows files and makes them easier to back up. (For partitioning resources, see the sidebar "Cover Your Knowledge Bases.")

5 REINSTALL WINDOWS

To install Windows from the CD, insert the disc and type **D:\setup** from the command prompt. (Substitute the drive letter of your CD-ROM for "D" if necessary.) The Windows installation procedure is fairly automatic, though you will be prompted along the way to fill in your product registration code, time zone, and a startup password, which you can leave blank so you won't be asked for a password each time you turn on the computer.

6 REINSTALL HARDWARE DEVICES

Once Windows is installed and booting properly, it may start prompting you to install driver software for hardware devices it recognizes but can't configure on its own. Since Windows may want to reboot every time you've finished installing a set of drivers, expect several restarts to configure all your devices. If you have a device that Windows doesn't recognize automatically, such as a parallel-port scanner, you'll have to initiate the installation process yourself using the disks that came with the device.



Be prepared to provide Windows with the drivers it needs to recognize your hardware.

7 CONNECT TO THE NET

How you do this depends a lot on what kind of Internet connection you have. If you're using dial-up and Windows has configured your modem correctly, it may be as easy as dragging your backup of the Dial-Up Networking settings onto the desktop. If, however, you use proprietary hardware such as a cable modem or DSL line, you'll need the setup disk you got from your ISP, along with the settings like login ID, password, the dial-up phone number, and so on. It's a good idea to have your ISP's customer-service phone number handy, just in case.

8 REINSTALL APPS

Reinstalling your programs is a big job, but fortunately you don't have to do it all at once. Start with the apps you use every day, and add less-used programs as the need arises. This slow approach prevents you from installing applications that you don't really need. It also gives you an opportunity to make sure you have the latest version of each program you install and to update each application as you install it.

9 RESTORE YOUR DATA

As you reinstall your applications, you can restore the data that goes with them. Install your MP3 player, for example, then restore your MP3 data files. Take this opportunity to organize those data files in a more logical fashion. If you aren't using the My Documents folder, with subfolders for My Music, My Pictures, and so on, now's a good time to start. ▼

Cover Your Knowledge Bases

Reinstalling Windows can be fairly complex, so you may want to consult some of the online sources that cover this issue in greater depth.

The ZDNet article "How to Back Up your PC" at ***www.zdnet.com/zdhelp/howtobackup,*** for example, provides step-by-step instructions, plus a number of links to related articles. (ZDNet is owned by CNET Networks, *Computer Shopper's* parent company.) CNET has its own backup tips at ***www.cnet.com/software/0-806180-7-2376963.html.***

You can also find sites that deal with specific issues such as backing up Outlook Express settings and saved mail files at ***chattanooga.net/~scochran/oe5faq.htm.*** You'll find a lot of good information about partitioning your hard drive at ***www.zdnet.com/zdhelp/partition.***

If you have questions about installing Windows, why not go to the source? Microsoft's support center has links to Windows setup articles at ***support.microsoft.com.***

Interim Measures

3 ESSENTIAL ZDNET DOWNLOADS

Backup to CD-RW
Back up your data to a CD-RW, Zip disk, or hard drive.

East-Tec FormatSecure 2001
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StartupRight
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HIDE YOUR FLOPPY DRIVE

Dear Alfred:

My system is accessing the empty floppy drive at odd, random times. What could be causing this? **Mike Mak**

Many things can cause your floppy drive to act on its own. One is automatic operations. You can turn these operations off (or at least exclude your floppy drive from them) and perform them manually when necessary. First, make sure any automatic virus scans exclude the floppy drive. Next, see if the Find Fast indexer is loaded on your system, by double-clicking on it in Control Panel. If it is, and there's an "index" to your floppy drive, delete it. You can also disable desktop-management utilities such as Norton Desktop. Some keep track of the last files you opened and continue checking their status in case you want to open them again. Finally, watch out for embedded links to files on your floppy drive, and delete the links if necessary. Adobe PageMaker is notorious for this, but just about any OLE-compatible program might have them.

TORN BETWEEN TWO BROWSERS

Dear Alfred:

Can I use Outlook Express with Netscape? I've had a lot of problems with different versions of Microsoft Internet Explorer, and I'd like to remove it in favor of Netscape, but I still want to use Outlook Express for my e-mail. **Judy Jones**

It's possible to use Outlook Express with Netscape, but if you remove Internet Explorer, you'll lose Outlook Express. There's no reason Netscape and Internet Explorer can't live together on your system; I have both installed on mine. Plus, if you ever decide to go back to Internet Explorer, it'll be there.

NOT ENOUGH PORTS IN A STORM

Dear Alfred:

I run into problems on my desktop computer when I try to connect my scanner to the same parallel port as my printer. How can I get them to work together? **Joelyne Rogers**

I have a basic rule: Use only one device per parallel port. You may be lucky and get two or more devices to work together on one port, but it's not worth the hassle. If you want to keep the scanner, consider adding another parallel port. A port add-in card costs $10 to $40, depending on the expansion-slot type and features.

If you're willing to replace the scanner and you have a USB port available, purchasing a scanner with a USB interface may be the fastest and easiest solution of all.

IT'S LATER THAN YOU THINK

Dear Alfred:

My system doesn't keep accurate time. I don't turn it off, yet it still loses about 20 minutes over an 8- to 10-hour period. **Nick Pasich**

If the power isn't turned off, it can't be the clock's backup battery. I suspect a program is running that's interfering with the clock. Here's a way to test this theory. At the end of the day, reboot the system in Safe Mode. Check the time, and let the system run overnight. If the clock is correct in the morning, something running in the background in normal mode is causing the problem. If the clock is wrong after running in Safe Mode, your system clock speed may be set incorrectly. ▼

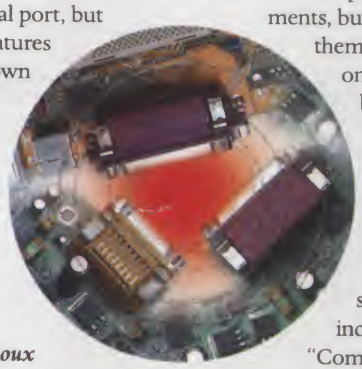
tip of the month

AVOID CONFLICTS

Most computer systems come loaded with ports, sound, graphics, and other features that were extra-cost items not so long ago. This month's tipster reminds us to turn off features we don't use. It costs so little to add a second serial port, but that extra port and other features may cause you problems down the line.

Dear Alfred:

Sometimes an IRQ conflict occurs between devices installed in your computer. Disabling some ports you're not using may fix this problem. **Mike Mailloux**



That's good advice. With today's abundance of internal modems, PS/2 mice, and USB scanners, many people don't have anything connected to their serial ports. The ports still take up IRQ assignments, however. Although they should be able to share IRQs, it's a simple matter to disable these ports in your motherboard's CMOS configuration settings.

Other ports and devices can also cause you avoidable heartburn. For instance, many parallel ports are configured to use an IRQ assignment, but this may only be required for DOS applications. You may be able to eliminate this assignment when running under Windows. Also, a parallel port configured as ECP will take up a DMA assignment (which can't be shared), while an EPP configuration won't. Some sound cards take up two DMA assignments, but you can configure them to work with a single one, if necessary. It's best to conserve your resources and not tie them up with unused hardware.

Send us your favorite tip, and you could receive a tipster's prize package, including a coveted "Computer Cures" T-shirt (one size fits all), plus some other exciting items you can't get anywhere else.

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BUYING ADVISOR

by Asa Somers

The Portable Price Plunge

When it comes to finding bargains, timing is everything.

IF YOU'VE BEEN MULLING A notebook purchase, now's a good time to buy. The current worldwide surplus of LCD panels, one of the most expensive components of a laptop, has caused panel prices to drop significantly in the past six months, in some cases to levels slightly below manufacturing costs. Notebook prices have fallen in step.

TFT-screen pricing for the first quarter of 2001 is down a whopping 42 percent over the same period last year, according to LCD-market-watch group DisplaySearch. But the free fall won't last. Analysts predict prices will flatten, and perhaps even start to climb, in the third quarter. Notebook prices should reflect the hike by the end of the year.

We let Shirley Westbrook, a 75-year-old retired schoolteacher from Reno, Nev., in on this little secret when she approached us about a notebook purchase. Westbrook wants to use her new laptop for dabbling in digital photography and video editing, in addition to everyday tasks such as Web browsing, e-mail, and letter writing. The first two applications will tax the notebook's graphics subsystem and RAM as much as they do the CPU. So a good graphics chipset, a large hard drive, and an IEEE 1394 (FireWire) port are necessities.

Westbrook also values a large screen, as well as a CD-RW drive for distributing files to others, but sees little reason for a DVD drive. She plans to connect to the Internet via broadband, so she also needs an Ethernet card. Westbrook travels only about four times a year, so she's not too concerned with weight and size. What she does consider crucial is an airtight, long-term warranty with onsite service.

This puts us in desktop-replacement, three-spindle territory. At current prices, Westbrook can get a lot for her money, because she's set a flexible budget of about $2,000. The trick is finding a notebook that combines certain high-end features, such as the IEEE 1394 port, a CD-RW drive, and a huge screen, with other midrange features, such as a fast (but not cutting-edge) CPU.

Dell Inspiron 8000

We began shopping at Sony, whose VAIO line of notebooks and desktops stand apart because of their focus on digital video. Finding a VAIO with an IEEE 1394 port was a cinch; Sony configures its notebooks with an impressive set of video-editing software and hardware options. But filling the rest of our needs was impossible.

CHALLENGE

USER PROFILE

Shirley Westbrook, a retired schoolteacher from Reno, Nev.

COMPUTING NEEDS

An all-in-one notebook for around $2,000 to perform standard tasks and some photo and video experimentation. It should include a few high-end features, such as a 15-inch screen, a CD-RW drive, and an IEEE 1394 port. Raw processor speed isn't crucial, but three years of onsite service is.

Unlike some of the bigger direct sellers, which offer fine control over most aspects of system configuration, Sony gives you a basic model you can tweak only a few ways. Within the All-in-One VAIO FX Series, we could opt for either a $2,499 **PCG-FX170** with an 800MHz Pentium III processor, 15-inch screen, 20GB hard drive, and DVD/CD-RW combo drive, or the $1,699 **PCG-FX140,** with a smaller screen and hard drive, 700MHz CPU, and only a DVD drive. So Westbrook would either spend too much or get too little. Moreover, Sony offers only a single-year warranty and no onsite service. As a result, neither of these VAIOs fits our profile.

We encountered similar problems at Acer and HP; their configurators weren't customizable enough, and offered only extremely expensive models with IEEE 1394 and CD-RW.

The 7.8-pound **Compaq Presario 1800** came close to meeting our needs. For $2,037 (plus shipping) we could get an 800MHz CPU, an 8x/4x/24x CD-RW drive, a 15-inch screen, 16MB graphics, great audio, a three-year mail-in warranty, and plenty of fun design elements, such as external audio-CD controls that let you play music even when the laptop's turned off. Unfortunately, built-in IEEE 1394 was available only with the more expensive Presario 800. The 1800 would require a third-party PC Card IEEE 1394 solution, which adds expense and hassle.

Gateway similarly fell short. IEEE 1394 capability demanded the costly Solo 9500CL model; the $2,247 (plus shipping) **Solo 9500CS** gave us everything we needed except the ports. Same with the **Toshiba Satellite Pro 4600,** priced at $2,219 (including shipping). It seemed like a slam-dunk, with its fast processor, high-end graphics chip, big hard drive, and DVD/CD-RW combo drive, but the screen measured only 14.1 inches, the carrying case cost extra, and you had to pay $288 more to upgrade the one-year warranty to three years of onsite service.

Nearly at wit's end, we turned to Dell and found what we needed: the hefty **Inspiron 8000,** configured for a relatively miserly $1,972 (plus shipping) with a 700MHz Pentium III, 8MB of video RAM, a 15-inch display, a 10GB hard drive, an 8x CD-RW drive, Microsoft Works, a modem, an Ethernet card, a carrying case, three years of onsite service, and, yes, a built-in IEEE 1394 port. (We skimped on processor speed and video RAM to save a few bucks.) And Westbrook could easily bump any of these options up a notch, thanks to Dell's industry-leading online configuration mechanism. ▼

SOLUTION

THE ADVISOR'S CHOICE

Thanks to recent drops in LCD prices, our advisee can save money no matter what she buys, but we found the mix of features and services she needs hard to find in a notebook. *With its built-in IEEE 1394, big screen, good graphics, and three-year onsite-service policy, only the* **Dell Inspiron 8000** met our needs.

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20.0GB	128K	4500	QML20000LD	$89
20.5GB	2MB	7200	QMP20500AS	$99
30.0GB	128K	4500	QML30000LD	$95
30.0GB	2MB	7200	QMP30000AS	$120
40.0GB	128K	4500	QML40000LD	$108
40.0GB	2MB	7200	QMP40000AS	$140
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9.2GB	8MB	10,000	TY309200SCA	$179
18.4GB	4MB	7200	XC318400SCA	$203
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36.7GB	8MB	10,000	TY336700SCA	$429
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9.2GB	8MB	10,000	TY309200LW	$179
18.4GB	4MB	7200	XC318400LW	$203
18.4GB	8MB	10,000	TY318400LW	$236
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60.0GB	512K	5400	ST360020A	$159
80.0GB	512K	5400	ST380020A	$225
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ULTRA Wide SCSI				
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18.4GB	2MB	7200	ST318437LW	$189
18.4GB	4MB	10,000	ST318405LW	$209
18.4GB	4MB	15,000	ST318451LW	$339
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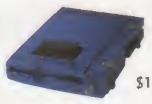

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	Externals			
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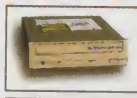

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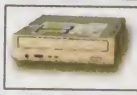

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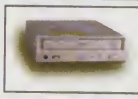

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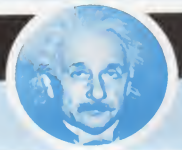

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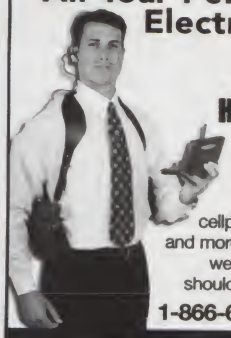

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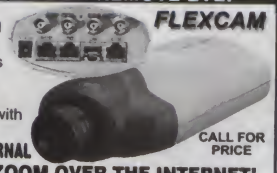

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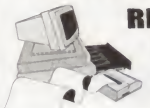

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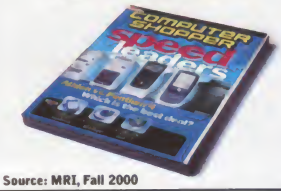

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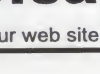

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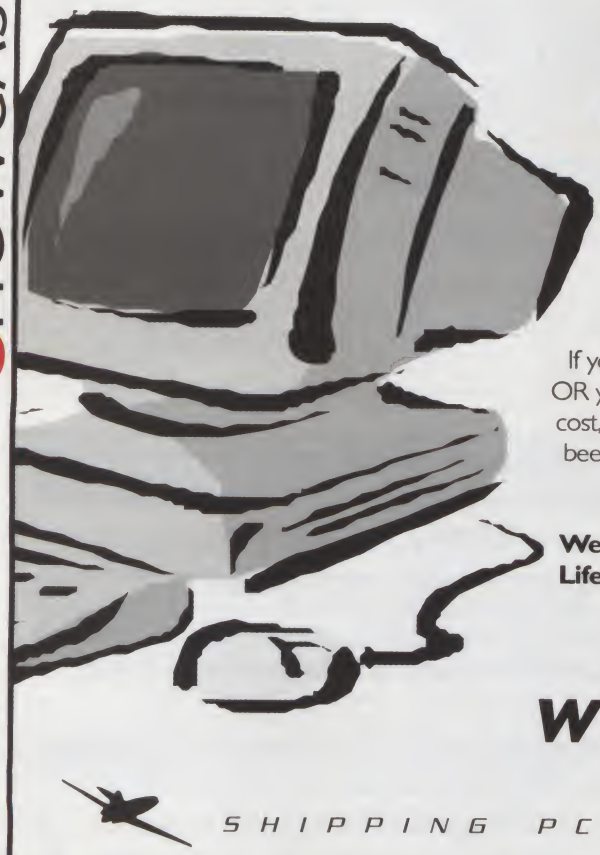

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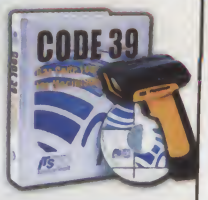

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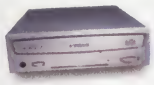

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ABKT7E	SOCKET A	6	1	1	3/168	ATX	$99
ABSL6	SOCKET 370	6		1+CNR	3/168	ATX	$114
ABBX133-RAID	SOCKET 370	5	1	1	3/168	ATX	$117
ABKT7A	SOCKET A	6	1	1	3/168	ATX	$117
ABSE6	SOCKET 370	6		1+CNR	3/168	ATX	$121
ABBE6II-RAID	SLOT 1	5	1	1	3/168	ATX	$122
ABSA6R	SOCKET 370	6		1+CNR	4/168	ATX	$124
ABKA7	SLOT A	6	1	1	4/168	ATX	$124
ABST6-RAID	SOCKET 370	6		1+CNR	3/168	ATX	$129
ABKT7	SOCKET A	6	1	1	3/168	ATX	$132
ABKT7A-RAID	SOCKET A	6	1	1	3/168	ATX	$136
ABSH6	SLOT 1	6		1+CNR	4/168	ATX	$137
ABVP6	DUAL 370	5		1	4/168	ATX	$142
ABKA7-100	SLOT A	6	1	1	4/168	ATX	$152
ABKT7-RAID	SOCKET A	6	1	1	3/168	ATX	$154
ABTH7-RAID	P4	5		1+CNR	4/RIMM	ATX	$167

ASUS www.asus.com

SKU	CPU	PCI	ISA	AGP	MEM	STYLE	PRICE
ASA7V-E-WOA	SOCKET A	6		1+AMR	2/168	MATX	$84
ASCUV4X	SOCKET 370	5	1	1	3/168	ATX	$107
ASCUV4X-C	SOCKET 370	5		1+AMR	2/168	ATX	$112
ASCUV4X-V	SOCKET 370	5	1	1+AMR	3/168	ATX	$112
ASCUSL2-C	SOCKET 370	6		1+2CNR	3/168	ATX	$112
ASCUBX-E	SOCKET 370	6		1	4/168	ATX	$116
ASA7PRO	SOCKET A	5		1+AMR	3/168	ATX	$122
ASCUSL2-CBP	SOCKET 370	6		1+CNR	3/168	ATX	$122
ASA7V133	SOCKET A	4		1+AMR	3/168	ATX	$130
ASCUSL2	SOCKET 370	6		1+2CNR	3/168	ATX	$137
ASA7V-WOA	SOCKET A	5		1+AMR	3/168	ATX	$142
ASCUV4X-D	DUAL 370	5		1	4/168	ATX	$151
ASA7A266	SOCKET A	4		1+AMR	2DDR/168	ATX	$152
ASP4T	P4	5		1	4/RIMM	ATX	$184
ASA7M266	SOCKET A	4		1+AMR	2/DDR	ATX	$185
ASCUV266	SOCKET 370	5		1+ACR	3/DDR	ATX	$229
ASCUV4X-DLS	DUAL 370	5		1	4/168	ATX	$317
ASP3CD	DUAL SLOT 1	5		1	3/RIMM	ATX	$362
ASCUR-DLS	DUAL 370	7		ASMS	4/168	ATX	$669

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IND815EEA2L	SOCKET 370	5	LAN		3/168	ATX	$129
IND850GB	P4	5		1	4/RIMM	ATX	$169
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MSI www.msicomputer.com

SKU	CPU	PCI	ISA	AGP	MEM	STYLE	PRICE
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MICK7TTURBO	SOCKET A	6		1+CNR	3/168	ATX	$103
MIC815EPRO	SOCKET 370	6		CNR	4/168	ATX	$104
MICK7TTURBOLTD	SOCKET A	6		1+CNR	3/168	ATX	$114
MICK7TTURBO-R	SOCKET A	6		1+CNR	3/168	ATX	$116
MICPRO266MSTR	SOCKET 370	5		1+CNR	3DDR/168	ATX	$117
MIC815EPPROR	SOCKET 370	6		1+CNR	4/168	ATX	$122
MICPR266MSTR-R	SOCKET 370	5		1+CNR	3DDR/168	ATX	$127
MICK7T266PRO	SOCKET A	5		1+CNR	3/DDR	ATX	$142
MICK7MASTER	SOCKET A	5		1+CNR	2/DDR	ATX	$143
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SKU	CPU	PCI	ISA	AGP	MEM	STYLE	PRICE
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GBGA-6VXE+	SLOT 1	5	2	1	3/168	ATX	$81
GBGA-6VXE7+	SOCKET 370	5	2	1	3/168	ATX	$81
GBGA-7IXE	SLOT A	5	2	1	3/168	ATX	$81
GBGA-6VA7+	SOCKET 370	4	2	1	3/168	AT	$82
GBGA-6VX7-4X	SOCKET 370	5	1	1	3/168	ATX	$89
GBGA-7ZM	SOCKET A	3		1+AMR	3/168	MATX	$96
GBGA-7ZX-1R5	SOCKET A	5		1+AMR	3/168	ATX	$101
GBGA-7ZX	SOCKET A	5	1	1+AMR	3/168	ATX	$102
GBGA-7ZX-1	SOCKET A	5	1	1+AMR	3/168	ATX	$102
GBGA-7ZXR5	SOCKET A	5	1	1+AMR	3/168	ATX	$107
GBGA-7ZXR	SOCKET A	5	1	1+AMR	3/168	ATX	$112
GBGA-7DXC	SOCKET A	5		1+AMR	2DDR	ATX	$137
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INTEL	PENTIUM III 100MHZ BUS	800MHZ	256K FCPGA	$129
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INTEL	PENTIUM III 100MHZ BUS	750MHZ	256K SECC	$84
INTEL	PENTIUM III 133MHZ BUS	800MHZ	256K SECC	$122
INTEL	PENTIUM III 100MHZ BUS	800MHZ	256K SECC	$127
INTEL	PENTIUM III 100MHZ BUS	850MHZ	256K SECC	$137
INTEL	PENTIUM III 133MHZ BUS	866MHZ	256K SECC	$142
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AMD	K7 SOCKET A TBIRD	266 MHZ BUS	P1000MHZ	$77
AMD	K7 SOCKET A TBIRD	200 MHZ BUS	P1100MHZ	$82
AMD	K7 SOCKET A TBIRD	266 MHZ BUS	P1133MHZ	$89
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AMD	K7 SOCKET A TBIRD	266 MHZ BUS	P1200MHZ	$92
AMD	K7 SOCKET A TBIRD	200 MHZ BUS	P1300MHZ	$124
AMD	K7 SOCKET A TBIRD	266 MHZ BUS	P1333MHZ	$125
AMD	K7 SOCKET A TBIRD	266 MHZ BUS	P1400MHZ	$149
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64MB	8X72 (buffered)	60NS 3.3VOLT ECC	$67
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128MB	16X72 (unbuffered)	60NS 3.3VOLT ECC	$134
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128MB PC150	16X64	7NS	$20
128MB	16X72	8NS	$18
128MB PC133	16X72	7.5NS	$19
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128MB	16X72	266MHZ	$29
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256MB	32X64	266MHZ	$47
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PC100/133/150

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CM654S128A-BX2	128MB	16X64	8NS		$31
CM654S128A-133	128MB PC133	16X64	7.5NS		$31
CM654S128A-133C2	128MB PC133	16X64	CAS2	7.5NS	$33
CM734S128A-BX2	128MB	16X72	8NS		$32
CM734S128-133	128MB PC133	16X72	7.5NS		$43
CM654S256-BX2	256MB	32X64	8NS		$52
CM654S256-133	256MB PC133	32X64	7.5NS		$52
CM654S256-133C2	256MB PC133	32X64	CAS2	7.5NS	$53
CM654S256-150C2	256MB PC150	32X64	CAS2	7NS	$54
CM724S256-133	256MB PC133	32X72	7.5NS		$57
CM724S256-BX2	256MB	32X72	8NS		$57
CM744S512-133	512MB PC133	64X72	7.5NS		$279
CM744S1024-133	1024MB PC133	128X72	7.5NS		$429

GX CHIPSETS

CM734S128A-GX2	128MB	16X72	8NS	$33
CM724S256-GX2	256MB	32X72	8NS	$57

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CM618DR256-800	256MB	RDRAM	800MHZ	$179

VALUE SELECT MEMORY PC100/133

VS64MB100	64MB	8X64	8NS	$16
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DDR RAM PC2100

CM64SD128-2100	128MB	16X64 DDR	266MHZ	$36
CM64SD128-2400C2	128MB (CAS 2)	16X64 DDR	300MHZ	$44
CM64SD128-2100C2	128MB (CAS 2)	16X64 DDR	266MHZ	$52
CM72SD128-2100	128MB	16X72 DDR	266MHZ	$47
CM64SD256-2100	256MB	32X64 DDR	266MHZ	$67
CM64SD256-2400C2	256MB (CAS 2)	16X64 DDR	300MHZ	$79
CM72SD256-2100	256MB	32X72 DDR	266MHZ	$82
CM72SD256R-2100	256MB (REG)	32X72 DDR	266MHZ	$97
CM72SD512R-2100	512MB (REG)	64X72 DDR	266MHZ	$484

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DVD CDROM CDRW

TOSHIBA www.toshiba.com

MODEL#	SPEED/TRANS	INTERFACE	ACCESS	CACHE	PRICE
TOSDM1402OEM	12X-40X DVD	ATAPI	135/90MS	256K	$62
TOSDM1502OEM	16X-48X DVD	ATAPI	115/95MS	256K	$59
TOSDR1002KIT	4X4X4X24	ATAPI	140/105MS	256K	$169
TOSDR1102KIT	8X8X8X32	ATAPI	140/105MS	256K	$179
TOSDW2002KIT	6X-24XDVDRAM	ATAPI	120MS	8192K	$429

MITSUMI www.mitsumi.com

MODEL#	SPEED/TRANS	INTERFACE	ACCESS	CACHE	PRICE
MIT48XIDE	48X/7200KB	ATAPI	85MS	128K	$33
MIT4804OEM	4X/4X/24X	ATAPI OEM	135MS	2048K	$73
MIT4805OEM	8X/4X/32X	ATAPI OEM	135MS	2048K	$79

YAMAHA www.yamaha.com

MODEL#	SPEED/TRANS	INTERFACE	ACCESS	CACHE	PRICE
YACRW2100EZKIT	16X/10X/40X	ATAPI	140MS	4096K	$137
YACRW2200EZKIT	20X/10X/40X	ATAPI	160MS	8192K	$229
YACRW2100SZKIT	16X/10X/40X	SCSI	140MS	4096K	$229

SONY www.sony.com

SY48XIDE	48X/7200KB	ATAPI	85MS	128K	$34
SY52XIDE	52X/7800KB	ATAPI	85MS	128K	$35
SYCRX140ECHOEM	8X/4X/32X	ATAPI	150MS	4096K	$79
SYCRX160E/CHOEM	12X/8X/32X	ATAPI	150MS	4096K	$97
SYCRX140E/CH	8X/4X/32X	ATAPI	150MS	4096K	$114
SYCRX160E/CH	12X/8X/32X	ATAPI	150MS	4096K	$157
SYCRX145S/CH	10X/4X/32X	SCSI	150MS	4096K	$247

PLEXTOR www.plextor.com

PX-W8432TI	8X/4X/32X	ATAPI	160MS	4096K	$132
PX-W1210TA	12X/10X/32X	ATAPI	150MS	2048K	$162
PX-W1610TA	16X/10X/40X	ATAPI	150MS	2048K	$189
PX-W124TSI	12X/4X/32X	SCSI	160MS	4096K	$299

NOTEBOOK DRIVES

TOSHIBA www.toshiba.com

ALL TOSHIBA IDE NOTEBOOK DRIVES LISTED HAVE A 1YR WARRANTY

MODEL#	CAP.(MB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
TO4313MAT	4300	13MS/4200	1024K	2.5"/8.4MM	$82
TO6015MAP	6000	13MS/4200	1024K	2.5"/9.5MM	$86
TO1016GAP	10000	13MS/4200	1024K	2.5"/9.5MM	$89
TO2016GAP	20000	13MS/4200	1024K	2.5"/9.5MM	$117
TO3017GAP	30000	13MS/4200	1024K	2.5"/9.5MM	$204

IBM www.ibm.com

ALL IBM IDE NOTEBOOK DRIVES LISTED HAVE A 1YR WARRANTY

MODEL#	CAP.(MB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
IBMDJSA-210000	10000	12MS/4200	512K	2.5"/9.5MM	$86
IBMDJSA-220000	20000	12MS/4200	512K	2.5"/9.5MM	$114
IBMDJSA-230000	30000	12MS/4200	512K	2.5"/12.5MM	$239
IBMDJSA-232000	32000	12MS/4200	512K	2.5"/12.5MM	$362

MONITORS

ViewSonic www.viewsonic.com

VIE55	15"	.28DP	1280 X 1024	$127
VIE70	17"	.27DP	1280 X 1024	$157
VIE70F	17"	.25DP	1280 X 1024 (FLAT)	$177
VIE70FB	17"	.25DP	1280 X 1024 (FLAT/BLACK)	$179
VIE70M	17"	.27DP	1280 X 1024	$189
VIG70M	17"	.27DP	1280 X 1024	$217
VIG70MB	17"	.27DP	1280 X 1024 (BLACK)	$217
VIGS773	17"	.27DP	1280 X 1024	$207
VIE90	19"	.27DP	1600 X 1200	$237
VIE95	19"	.26DP	1600 X 1200	$269
VIPS775	17"	.25DP	1600 X 1280	$259
VIE790	19"	.26DP	1600 X 1200	$299
VIGS790	19"	.26DP	1600 X 1200	$312
VIG90F	19"	.25DP	1600 X 1200 (FLAT)	$312
VIG90M	19"	.26DP	1600 X 1200	$307
VIG90MB	19"	.26DP	1600 X 1200 (BLACK)	$307
VIPF790	19"	.25DP	1600 X 1280	$364
VIPS790	19"	.25DP	1600 X 1280	$479
VIGS815	21"	.25DP	1920 X 1440	$729
VIP220F	22"	.25DP	1600 X 1200	$724
VIP225F	22"	.24DP	2048 X 1536 (FLAT)	$789
VIP817	21"	.25DP	2048 X 1536	$1399
VIVE150	LCD MONITOR 15" VIEWABLE 1024 X 768			$387
VIVP150M	LCD MONITOR 15" VIEWABLE 1024 X 768			$634
VIVE170	LCD MONITOR 17" VIEWABLE 1280 X 1024			$769
VIVG175	LCD MONITOR 17.4" VIEWABLE 1280 X 1024			$889
VIVG181	LCD MONITOR 18.1" VIEWABLE 1280 X 1024			$1679

RELYSIS www.relysis.com

RETE555	15"	.28DP	1280 X 1024	$112
RETE770	17"	.28DP	1280 X 1024	$129
RETE786H	17"	.25DP	1600 X 1200	$157
RETE786T	17"	.26DP	1280 X 1024	$167
RETE988	19"	.26DP	1600 X 1200	$227
RETL500A	LCD MONITOR 15" VIEWABLE 1024 X 768			$359
RETL700A	LCD MONITOR 17" VIEWABLE 1280 X 1024			$779

IDE HARD DRIVES

WESTERN DIGITAL www.wdc.com

ALL WESTERN DIGITAL IDE DRIVES LISTED HAVE A 3YR WARRANTY

MODEL#	CAP.(MB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
WD200AB	20500	8.5MS/5400	2048K	3.5"/1"H	$72
WD200BB	20000	9 MS/7200	2048K	3.5"/1"H	$82
WD400AB	40000	8.5MS/5400	2048K	3.5"/1"H	$92
WD300BB	30000	9 MS/7200	2048K	3.5"/1"H	$97
WD400BB	40000	9 MS/7200	2048K	3.5"/1"H	$108
WD600AB	60000	8.5MS/5400	2048K	3.5"/1"H	$132
WD600BB	60000	9 MS/7200	2048K	3.5"/1"H	$157
WD800BB	80000	9 MS/7200	2048K	3.5"/1"H	$189

IBM www.ibm.com

ALL IBM IDE DRIVES LISTED HAVE A 3YR WARRANTY

MODEL#	CAP.(MB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
IBM305040	40000	9.5MS/5400	2048K	3.5"/1"H	$87
IBM35L020	20000	8.5MS/7200	2048K	3.5"/1"H	$83
IBM35L040	40000	8.5MS/7200	2048K	3.5"/1"H	$109
IBM35L060	60000	8.5MS/7200	2048K	3.5"/1"H	$153
IBM307075	75000	8.5MS/7200	2048K	3.5"/1"H	$226
IBM35L075	75000	8.5MS/7200	2048K	3.5"/1"H	$228

Maxtor www.maxtor.com

ALL MAXTOR IDE DRIVES LISTED HAVE A 3YR WARRANTY

MODEL#	CAP.(MB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
MAX204-5400	20400	9.5 MS/5400	2048K	3.5"/1"H	$70
MAX153-7200	15300	9.5 MS/7200	2048K	3.5"/1"H	$73
MAX307-5400	30700	9.5 MS/5400	2048K	3.5"/1"H	$83
MAX204-7200	20400	9.5 MS/7200	2048K	3.5"/1"H	$83
MAX409-5400	40900	9 MS/5400	2048K	3.5"/1"H	$90
MAX307-7200	30700	9.5 MS/7200	2048K	3.5"/1"H	$102
MAX409-7200	40900	9.5 MS/7200	2048K	3.5"/1"H	$114
MAX614-5400	61400	9 MS/5400	2048K	3.5"/1"H	$140
MAX614-7200	61400	9.5 MS/7200	2048K	3.5"/1"H	$163
MAX819-5400	81900	9 MS/5400	2048K	3.5"/1"H	$200

CONTROLLERS

PROMISE TECHNOLOGY, INC. www.promisetechnology.com

PRULTRA66	ULTRA ATA66 PCI 4 HARD DRIVE	$22
PRULTRA100	ULTRA ATA100 PCI 4 HARD DRIVE	$36
PRULTRA100TX2	ULTRA ATA100 TX2 PCI 4 HARD DRIVE	$36
PRFASTRAK100TX2	ULTRA ATA100 RAID TX2 PCI	$74
PRFASTRAK100	ULTRA ATA100 RAID PCI	$77
PRFASTRAK100LP	ULTRA ATA100 RAID LOW PROFILE PCI	$107

adaptec www.adaptec.com

AD2940AUOEM	ULTRA SCSI BUS MSTR 20MB/SEC OEM	$151
AD2940UWPROOEM	ULTRA 2 PCI 80MB/SEC OEM	$184
AD29160OEM	ULTRA 2 PCI BUS MSTR 160MB/SEC OEM	$195
AD19160KIT	ULTRA 2 PCI BUS MSTR 160MB/SEC RETAIL	$214
AD2940U2WOEM	ULTRA 2 PCI BUS MSTR 80MB/SEC OEM	$219
AD29160KIT	ULTRA 2 PCI BUS MSTR 160MB/SEC RETAIL	$283

SCSI HARD DRIVES

WESTERN DIGITAL www.wdc.com

ALL WESTERN DIGITAL SCSI DRIVES LISTED HAVE A 5YR WARRANTY

MODEL#	CAP.(MB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
WD91FG	9100	6.6MS/10000	2048K	3.5"/1"H	$99
WDE9150-0050	9100	5.2MS/10000	2048K	3.5"/1"H	$104
WDE18310-0040	18300	5.2MS/10000	2048K	3.5"/1"H	$199
WDE18310-0050	18300	5.2MS/10000	2048K	3.5"/1"H	$204

Seagate www.seagate.com

ALL SEAGATE SCSI DRIVES LISTED HAVE A 5YR WARRANTY

MODEL#	CAP.(MB)	ACCESS/RPM	CACHE	FORM/HT	PRICE
ST39236LW	9200	5.8MS/7200	2048K	3.5"/1"H	$187
ST39216N	9200	5.8MS/7200	2048K	3.5"/1"H	$179
ST39236LWV	9200	5.8MS/7200	4096K	3.5"/1"H	$199
ST318416N	18400	5.8MS/7200	2048K	3.5"/1"H	$234
ST318416W	18400	5.8MS/7200	2048K	3.5"/1"H	$234
ST318437LW	18400	8.5MS/7200	2048K	3.5"/1"H	$199
ST318436LWV	18400	5.8MS/7200	4096K	3.5"/1"H	$237
ST318405LW	18400	5.4MS/10,000	4096K	3.5"/FH	$229
ST318405LC	18400	5.4MS/10,000	4096K	3.5"/FH	$229
ST318451LW	18400	5.2MS/15,000	4096K	3.5"/FH	$334
ST318451LC	18400	5.2MS/15,000	4096K	3.5"/FH	$334
ST336737LW	36700	8.5MS/7200	2048K	3.5"/1"H	$359
ST336737LC	36700	8.5MS/7200	2048K	3.5"/1"H	$359
ST336705LW	36700	5.4MS/10,000	4096K	3.5"/FH	$427
ST336704LWV	36700	5.2MS/10,000	16000K	3.5"/FH	$449
ST373405LW	73400	4.9MS/10,000	4096K	3.5"/FH	$787
ST373405LC	73400	4.9MS/10,000	4096K	3.5"/FH	$787
ST373405LCV	73400	4.9MS/10,000	16000K	3.5"/FH	$799

VIDEO CARDS

matrox www.matrox.com

MATG45016SDR	G450 16MB, SDR AGP OEM (DUAL)	$65
MATG45016DDR	G450 16MB, DDR AGP OEM (DUAL)	$68
MATG45032DDR	G450 32MB, DDR AGP OEM (DUAL)	$87
MATG45032DDRBOX	G450 32MB, DDR AGP RET(DUAL)	$119
MATMARG45032A	MARVEL G450 32MB, DDR AGP OEM	$179

ATI www.atitech.com

ATIX200032A	EXPERT 2000 AGP OEM VER 32MB	$39
ATIX2KPRO32A	EXPERT 2000PRO AGP OEM VER 32MB	$46
ATIRFPRO32ATV	RAGE FURY PRO AGP OEM 32MB W/TV	$64
ATIRADLE32A	RADEON LE AGP OEM 32MB DDR	$75
ATIRADVE32A	RADEON VE AGP OEM 32MB DDR DUAL	$79
ATIRFMAX64	RAGE FURY MAX AGP OEM 64MB	$99
ATIAIWPRO32A	ALL-IN-WONDER PRO AGP OEM 32MB	$104
ATIRADEON64A	RADEON AGP OEM 64MB DDR	$159
ATIAIWRAD32A	ALL-IN-WOND RADEON AGP OEM 32MB	$189

ABIT www.abit-usa.com

ABGF2MX32ANO	GEFORCE-2 MXS AGP 32MB	$86
ABGF2MX32ATV	GEFORCE-2 MXS W/TV AGP 32MB	$89
ABGF2256GTS64	GEFORCE-2 GF256 W/TV AGP 32MB	$297

ASUS www.asus.com

ASV710032A	GEFORCE-2 MX AGP 32MB	$94
ASV710032ATV	GEFORCE-2 MX W/TV AGP 32MB	$99
ASV71002VD	GEFORCE-2 TWINVIEW AGP 32MB	$102
ASV7700P32A	GEFORCE-2 AGP 32MB DDR	$139
ASV7700DEL32A	GEFORCE-2 DEL AGP 32MB DDR	$167
ASV7700P64A	GEFORCE-2 AGP 64MB DDR	$219
ASV7700PROP64	GEFORCE-2 AGP 64MB PRO PURE	$219
ASV7700DEL64A	GEFORCE-2 DEL AGP 64MB DDR	$244
ASV7700ULTP64	GEFORCE-2 AGP 64MB ULTRA PURE	$324
ASV8200P64A	GEFORCE-3 PUR AGP 64MB DDR	$344
ASV8200D64A	GEFORCE-3 DEL AGP 64MB DDR	$369

SOUND CARDS

CREATIVE www.creative.com

CLCT4815	SOUND BLSTR PCI ES4815 OEM	$20
CLSB4525	SOUND BLSTR ISA 16 WAVE FX RETAIL	$20
CLCT4520	SOUND BLSTR AWE 64 ISA OEM	$24
CLCT4750	SOUND BLSTR PCI 128 OEM	$31
CLCT4832	SOUND BLSTR LIVE VALUE PCI OEM	$45
CLSBLIVE5.1OE	SOUND BLSTR LIVE OEM	$61
CLSBLXG5.1R	SOUND BLSTR LIVE X-GAMER RETAIL	$89
CLSBLMP3+5.1R	SOUND BLSTR LIVE MP3+ RETAIL	$89
CLSBLPLAT5.1R	SOUND BLSTR LIVE PLATINUM RET	$175

MODEMS

3Com www.3com.com

3C3595	56 KBPS DATA/14.4kbps FAX INT PCI V.90 OEM/WIN	$21
3C3594	56 KBPS DATA/14.4kbps FAX INT PCI V.90 OEM/VOICE	$24
3C2975	56 KBPS DATA/14.4kbps FAX INT PCI V.90 OEM/NO VOICE	$33
3C2974	56 KBPS DATA/14.4kbps FAX INT PCI V.90 OEM/VOICE	$37
3C2977	56 KBPS DATA/14.4kbps FAX INT PCI V.90 OEM/NON WIN	$43
3C2976	56 KBPS DATA/14.4kbps FAX INT PCI V.90 OEM/NON WIN	$52

CREATIVE www.creative.com

CLDI5655	56 KBPS DATA/14.4kbps FAX INT PCI V.90 VOICE	$25
CLDI5660	56 KBPS DATA/14.4kbps FAX INT PCI V.90 NON WIN	$25

REMOVABLES

IOMEGA www.iomega.com

IOZIP100IDE	REMOVABLE DRIVE	100MB INT ZIP	IDE OEM	$44
IOZIP250IDE	REMOVABLE DRIVE	250MB INT ZIP	IDE OEM	$67
IOZIP250USB	REMOVABLE DRIVE	250MB EXT ZIP	USB	$164
IOSCSI2GBINT	REMOVABLE DRIVE	2GB INT JAZ	SCSI	$259
IOSCSI2GBEXT	REMOVABLE DRIVE	2GB EXT JAZ	SCSI	$314

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- Accupointer
- Sound
- Floppy
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- Battery & adapter
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IBM

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- 12.1" Active Color
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- Sound
- Floppy
- Serial, parallel, vga, usb, ports
- Battery & adapter
- 33.6k fax
- Refurbished

IBM

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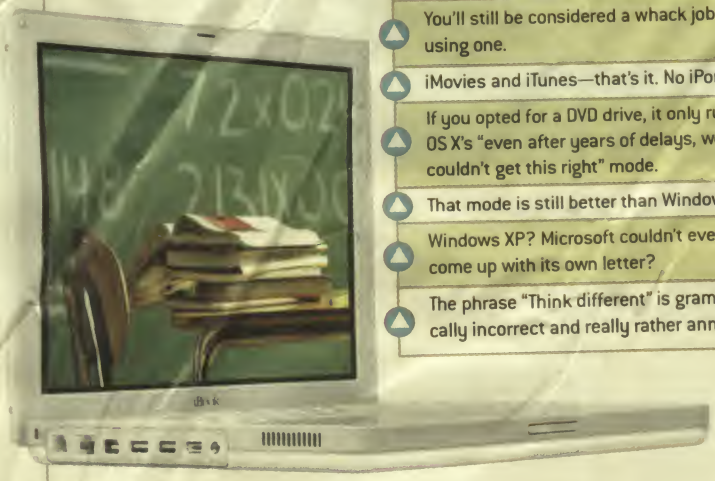
CHECKING Out

EDITED BY KIERSTEN CONNER-SAX

BACK TO SCHOOL WITH iBOOK

Headed back to school with your shiny new Apple iBook? Here are a few things to keep in mind:



- It's more stylish, more powerful, and stabler than comparably priced machines, and the battery lasts twice as long.
- You'll still be considered a whack job for using one.
- iMovies and iTunes—that's it. No iPorn.
- If you opted for a DVD drive, it only runs in OS X's "even after years of delays, we still couldn't get this right" mode.
- That mode is still better than Windows.
- Windows XP? Microsoft couldn't even come up with its own letter?
- The phrase "Think different" is grammatically incorrect and really rather annoying.

FAQ: TiVo DIGITAL VIDEO RECORDERS

We love our TiVo digital video recorder. But we also hate it. Recently, we visited a TiVo FAQ on the Web, looking for support.

Q What is "time shifting"?
A Time shifting is a technique that lets you record a live television program for viewing at another time. TiVo has a patent on this technique. No one else does. We don't care what they say.

Q How does that make TiVo different from a $100 VCR?
A TiVo automatically finds and records the programs you want to watch. It's so easy to use that you won't even notice our poorly designed interface or the software problems plaguing many of our machines. And have you noticed our cute icon? He's smiling at you.

Q Can you tape *Buffy the Vampire Slayer* for me?
A TiVo can record *Buffy the Vampire Slayer*, no matter which network the program appears on. But no, we won't tape it for you. Stop asking.

Q Does it actually work?
A Sure it works! Maybe it's time-consuming and frustrating to install; maybe the software upgrade contains a bug we can't identify. But did we mention that movie star Shannon Elizabeth, interviewed on our site, is a TiVo fanatic? She was in *American Pie*! And in *Scary Movie*! Look at the icon, he's smiling at you!

SHOPPER ON THE STREET

We asked six *Computer Shopper* readers to name the feature of the upcoming Windows XP operating system they were most excited about.

Arthur Vandelay
Justice Department Lawyer
"You mean, I could actually have a computer that doesn't crash three to five times each day? Come on."

Gwendolyn Leigh
Department-Store Buyer
"Turning over even more of my autonomy to Microsoft!"

George Elliott
Newspaper Columnist
"Smart tags—now there's a good idea. I don't know why other manufacturers use dumb tags."

Dana Oberkfell
Fund Manager
"New icons! That's what makes the difference to me!"

Jordan Baker
Professional Golfer
"The larger, bright green Start button. A green button is certainly worth the hassle and expense of installing a new operating system."

Mugsy
Airline Pilot
"The simplified home networking will make it a snap for me to create a peer-to-peer network, using only network interface cards and CAT-5 cable."

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– August 2001

Introducing the Dell™ OptiPlex™ GX150 desktop with a corporate look, minus the corporate price tag. Our line of 100% tool-less chassis allows for more efficient servicing, minimizing your downtime and making upgrades a breeze. Our small desktop and new small form factor chassis are ideal for limited workspaces while the new mini-tower chassis is great for those in need of expandability. And they're all flexible enough to run today's best applications and support emerging E-Business software, so you'll always be ahead of the pack. No matter what the dress code.

DELL™ OPTIPLEX™ GX150

Network-Optimized Managed PC

- Intel® Pentium® III Processor at 1.0GHz
- 128MB Shared[20] SDRAM (up to 512MB)
- 20GB[5] (7200 RPM) ATA/100 HD
- 17" (16.0" vis) E771p Monitor
- Integrated 3Com® 10/100 NIC
- Integrated Graphics with 4MB Graphics Performance Accelerator
- 48X Max CD-ROM ■ Integrated AC97 Audio
- MS® Windows® 2000 Professional
- OptiFrame™ Small Mini-Tower Chassis
- 3-Yr NBD On-Site Service[4]

$1199 E•VALUE CODE 05033-390811

BUSINESS LEASE: $33/MO., 48 MOS.[11]

- APC® SurgeStation Pro8T2 (8 Outlets), add $39
- Upgrade to Sony Trinitron® P780 Monitor (As Shown in Photograph), add $100

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Dell recommends Windows 2000 Professional for business.

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1.0GHZ. NOW IN NOTEBOOK FORM.

intel inside pentium®III

PC World, #1 Best Buy
Power Notebook
Dell™ Inspiron™ 8000
– August 2001

Once, having a PC that ran at the speed of light meant being locked indoors. Well, now you can have the performance of an Intel® Pentium® III processor at 1.0GHz with the convenience of a Dell™ Inspiron™ 8000 notebook. And to show off the newfound power, there's a 15" display and a 16MB graphics card for blazing-fast images and brilliant displays. And if that's not enough, you can also burn a CD and watch a DVD simultaneously on battery power or run up to 2 batteries while on the go. So now you can challenge light to a race. Anywhere, anytime.

DELL™ INSPIRON™ 8000

Pinnacle of Performance Notebook

- Intel® Pentium® III Processor at 1.0GHz
- 15" Super XGA TFT Display
- 128MB 100MHz SDRAM ■ 10GB[5] Ultra ATA HD
- Fixed Internal 24X Max Variable CD-ROM
- Modular Floppy Drive
- 16MB ATI® Mobility™-M4 3D® Video, 4X AGP
- 59WHr Li-Ion Battery w/ExpressCharge™ Technology
- Internal Mini-PCI 56K Capable® Modem
- MS® Office XP Small Business
- MS® Windows® Me
- 1-Yr Ltd Warranty[2], 1-Yr Mail-in Service, 1-Yr Phone Tech Support

$1889 E•VALUE CODE 05032-890818

BUSINESS LEASE: $52/MO., 48 MOS.[11]

- NEW Fixed Internal CD-RW/DVD Combo Drive, add $299

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Dell recommends Windows 2000 Professional for business.

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DELL™ HOME DESKTOPS:

DELL™ DIMENSION™ L Series

Affordable Desktop Solution

- Intel® Pentium® III Processor at 1.0GHz
- 128MB Shared SDRAM[39] at 100MHz
- 20GB[5] Value HD
- 17" (16.0" vis) E770 Monitor
- Integrated Intel® 3D® AGP Graphics
- 48X Max CD-ROM Drive
- Sound Blaster® 64V PCI LC Sound Card
- Harman Kardon® HK-195 Speakers
- 56K Capable[6] PCI DataFax Modem
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Ltd Warranty[2] ■ 1-Yr At-Home Service[4]
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$799 or as low as **$24** per mo. 45 mos.[12]

No payments for 90 days.[12] E-VALUE Code: 05031-500807c

DELL™ DIMENSION™ 4100 Series

Advanced Performance, Smart Value

- Intel® Pentium® III Processor at 1.0GHz
- 128MB SDRAM at 133MHz
- 20GB[5] Ultra ATA/100 HD (7200 RPM)
- 17" (16.0" vis, .28dp) E770 Monitor
- 16MB ATI® Rage™ 128 Pro
- 8X/4X/32X CD-RW Drive
- SB Live! 1024 Digital Sound Card
- Harman Kardon® HK-195 Speakers
- 56K Capable[6] PCI Telephony Modem
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Ltd Warranty[2] ■ 1-Yr At-Home Service[4]
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$1099 or as low as **$33** per mo. 45 mos.[12]

No payments for 90 days.[12] E-VALUE Code: 05031-500810a

- 19" (18.0" vis, .26dp) M991 Monitor, add $140

DELL™ DIMENSION™ 8100 Series

Cutting-Edge Technology

- Intel® Pentium® 4 Processor at 1.5GHz
- 128MB RDRAM
- 40GB[5] Ultra ATA/100 HD (7200 RPM)
- 19" (18.0" vis, .26dp) M991 Monitor
- 32MB NVIDIA® GeForce2 MX 4X AGP Graphics Card with TV Out
- NEW 16X Max DVD-ROM Drive
- SB Live! 1024 Digital Sound Card
- Harman Kardon® HK-695 Surround Sound Speakers with Subwoofer
- 56K Capable[6] PCI Telephony Modem
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Ltd Warranty[2] ■ 1-Yr At-Home Service[4]
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$1499 or as low as **$45** per mo. 45 mos.[12]

No payments for 90 days.[12] E-VALUE Code: 05031-500814

DELL™ HOME NOTEBOOKS:

DELL™ INSPIRON™ 2500

Great Notebook, Great Price

- Intel® Celeron™ Processor at 800MHz
- 14.1" XGA TFT Display
- 128MB SDRAM
- 10GB[5] Ultra ATA HD
- Fixed 24X Max CD-ROM Drive
- Integrated Intel® 3D® AGP Video
- Internal 56K Capable[6] FaxModem
- 26.5WHr Li-Ion Battery
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Ltd Warranty[2] ■ 1-Yr Mail-in Service
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$1079 or as low as **$33** per mo. 45 mos.[12]

No payments for 90 days.[12] E-VALUE Code: 05031-800810a

DELL™ INSPIRON™ 4000

Thin and Light

- Intel® Pentium® III Processor at 800MHz Featuring Intel® SpeedStep™ Technology
- 14.1" XGA TFT Display
- 192MB 100MHz SDRAM
- 20GB[5] Ultra ATA HD
- Modular Removable 8X Max DVD-ROM Drive
- 8MB ATI® Rage Mobility™ 128 3D® Video, 2X AGP
- Internal 56K Capable[6] FaxModem
- 59WHr Li-Ion Battery w/ExpressCharge™ Technology
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Ltd Warranty[2] ■ 1-Yr Mail-in Service
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$1629 or as low as **$49** per mo. 45 mos.[12]

No payments for 90 days.[12] E-VALUE Code: 05031-800816

DELL™ INSPIRON™ 8000

Multimedia Mobile Desktop

- Intel® Pentium® III Processor at 1.0GHz
- 15" XGA Ultra TFT Display
- 256MB 100MHz SDRAM
- 20GB[5] Ultra ATA HD
- Fixed 8X Max DVD-ROM Drive
- 32MB DDR NVIDIA® GeForce2 Go™ 3D® Video, 4X AGP
- Internal 56K Capable[6] FaxModem
- 59WHr Li-Ion Battery
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Ltd Warranty[2] ■ 1-Yr Mail-in Service
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$2399 or as low as **$72** per mo. 45 mos.[12]

No payments for 90 days.[12] E-VALUE Code: 05031-800823

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Phone Hours: M-F 7a-9p [illegible] Sat 10a-6p Sun 12p-5p CT In Canada, call 800-232-6306 In Mexico, call 001-877-269-3375

[10]Telephone access (call your phone co for details) and other surcharges for access may apply. Must register within 30 days of invoice and accept DellNet/MSN Terms of Service. You agree to be billed monthly fees after the initial service period. You may cancel service at any time. Offer valid for new customers only in U.S. households and must be over 18 years old with major credit card. Limited time offer. [12]Monthly payment based on 13.99% APR FOR QUALIFIED CUSTOMERS. OFFER VARIES BY CREDITWORTHINESS OF CUSTOMER AS DETERMINED BY LENDER. Under 90 Days Same-As-Cash feature, interest accrues during first 90 days if balance not paid within 90 days. Customers not eligible for 90 Days Same-As-Cash feature may be offered standard 48-month financing with APRs ranging from 16.99% to 26.99%. Example: $1,650 purchase price, at 19.99%, 48 monthly payments at $51. Taxes and shipping charges extra and vary. From American Invest-ment Bank, N.A. or CIT OnLine Bank to U.S. residents with approved credit.

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DELL™ BUSINESS DESKTOPS:

DELL™ DIMENSION™ 4100 Series

Advanced Business Desktop

- Intel® Pentium® III Processor at 1.0GHz
- 64MB SDRAM (up to 512MB)
- 20GB[5] Value HD
- 15" (13.8" vis) M570 Monitor
- 16MB ATI® Rage™ Pro Graphics
- 48X Max CD-ROM
- Integrated Audio with Sound Blaster® 64V Pro/16
- Harman Kardon® HK-195 Speakers
- MS® Windows® Me & MS® Works Suite 2001 & Norton® AntiVirus™
- 1-Yr Ltd Warranty[2] ■ 1-Yr NBD On-Site Service[4]

$799 E•VALUE CODE 05031-590807

BUSINESS LEASE: $22/MO., 48 MOS.[11]

- MS® Windows® 2000 Professional, add $99
- 3-Yr NBD On-Site Service[4], add $119
- APC® SurgeStation Pro8T2, add $39

DELL™ DIMENSION™ 8100 Series

Cutting-Edge Business Desktop

- NEW Intel® Pentium® 4 Processor at 1.3GHz
- 128MB RDRAM (up to 2GB)
- 20GB[5] Value HD
- 15" (13.8" vis) E551 Monitor
- 32MB NVIDIA® GeForce2 MX 4X AGP Graphics
- 48X Max CD-ROM
- Integrated 3Com® 10/100 NIC
- MS® Windows® Me & MS® Works Suite 2001 & Norton® AntiVirus™
- 1-Yr Ltd Warranty[2] ■ 1-Yr NBD On-Site Service[4]

$999 E•VALUE CODE 05031-590809

BUSINESS LEASE: $28/MO., 48 MOS.[11]

- MS® Windows® 2000 Professional, add $99
- 3-Yr NBD On-Site Service[4], add $119
- Lexmark™ E312L Laser Printer, add $269

DELL™ OPTIPLEX™ GX150

Network-Optimized Managed PC

- Intel® Pentium® III Processor at 1.0GHz
- 128MB Shared[30] SDRAM (up to 512MB)
- 20GB[5] (7200 RPM) ATA/100 HD
- 17" (16.0" vis) E771p Monitor
- Integrated 3Com® 10/100 NIC
- Integrated Graphics with 4MB Graphics Performance Accelerator
- 48X Max CD-ROM
- Integrated AC97 Audio
- MS® Windows® 2000 Professional
- OptiFrame™ Small Mini-Tower Chassis
- 3-Yr NBD On-Site Service[4]

$1199 E•VALUE CODE 05031-390811

BUSINESS LEASE: $33/MO., 48 MOS.[11]

- APC® SurgeStation Pro8T2 (8 Outlets), add $39
- Upgrade to Sony Trinitron® P780 Monitor, add $100

DELL™ BUSINESS NOTEBOOKS:

DELL™ INSPIRON™ 2500

NEW—Practical and Affordable Notebook

- Intel® Celeron™ Processor at 800MHz
- 12.1" SVGA TFT Display
- 128MB Shared[30] PC100 SDRAM
- 10GB[5] Ultra ATA HD
- Fixed Internal 24X Max Variable CD-ROM
- Intel® Integrated 3D® AGP Video
- 26.5WHr Li-Ion Battery
- Internal Mini-PCI 56K Capable[6] Modem
- MS® Works Suite 2001 ■ MS® Windows® Me
- 1-Yr Ltd Warranty[2], 1-Yr Mail-in Service, 1-Yr Phone Tech Support

$949 E•VALUE CODE 05031-890809

BUSINESS LEASE: $26/MO., 48 MOS.[11]

- 3-Yr Mail-in Service with Lifetime Phone Tech Support, add $99
- APC® Notebook Surge Protector, add $30

DELL™ INSPIRON™ 8000

Pinnacle of Performance Notebook

- Intel® Pentium® III Processor at 1.0GHz
- 15" Super XGA TFT Display
- 128MB 100MHz SDRAM
- 10GB[5] Ultra ATA HD
- Fixed Internal 24X Max Variable CD-ROM
- Modular Floppy Drive
- 16MB ATI® Mobility™-M4 3D® Video, 4X AGP
- 59WHr Li-Ion Battery w/ExpressCharge™ Technology
- Internal Mini-PCI 56K Capable[6] Modem
- MS® Office XP Small Business
- MS® Windows® Me
- 1-Yr Ltd Warranty[2], 1-Yr Mail-in Service, 1-Yr Phone Tech Support

$1889 E•VALUE CODE 05031-890818

BUSINESS LEASE: $52/MO., 48 MOS.[11]

- NEW Fixed Internal CD-RW/DVD Combo Drive, add $299

DELL™ LATITUDE™ C500

NEW—Wireless-Ready Value Notebook

- Intel® Celeron™ Processor at 700MHz
- 12.1" SVGA Active Matrix Display (14.1" XGA Available)
- 64MB SDRAM ■ 6GB[5] Ultra ATA HD
- 8MB ATI® Mobility™ 128 Video, 2X AGP
- MS® Windows® 98, Second Edition
- Modular 24X Max CD-ROM/Floppy Drive
- Internal Mini-PCI 56K Capable[6] SoftModem
- Li-Ion Battery w/ExpressCharge™ Technology
- Dual Pointing – Touchpad and Pointing Stick
- 1-Yr NBD On-Site Service[4]

$1299 E•VALUE CODE 05031-790812

BUSINESS LEASE: $36/MO., 48 MOS.[11]

- 14.1" XGA Active Matrix Display, add $150
- Deluxe Nylon Carrying Case, add $69

DELL™ SERVERS AND WORKSTATIONS:

DELL™ POWEREDGE™ 500SC

NEW—Basic Server at Our Lowest Price

- Intel® Celeron™ Processor at 800MHz (Available in Intel® Pentium® III Processor)
- 64MB 133MHz ECC SDRAM (up to 2GB)
- 10GB[5] (7200 RPM) IDE HD
- 48X Max IDE CD-ROM
- 1-Yr NBD On-Site Service[4], 1-Yr Parts[2]
- 7x24 Phone Tech Support

$699 E•VALUE CODE 05031-290806

BUSINESS LEASE: $19/MO., 48 MOS.[11]

DELL™ POWEREDGE™ 1400SC

NEW—Small Business Value Server

- Intel® Pentium® III Processor at 933MHz
- Dual Processor Capable
- 128MB 133MHz ECC SDRAM (up to 2GB)
- 9GB[5] (10K RPM) Ultra3 (Ultra 160) SCSI HD (up to 36GB[5] 10K RPM)
- 48X Max IDE CD-ROM
- Embedded Ultra3 (Ultra 160) SCSI Controller
- Dell™ OpenManage™ Server Management
- 3-Yr NBD Bronze On-Site Service[4]
- 7x24 Phone Tech Support

$999 E•VALUE CODE 05031-290809

BUSINESS LEASE: $28/MO., 48 MOS.[11]

- 2nd 9GB[5] (10K RPM) Ultra3 SCSI HD, add $249
- MS® Small Business Server, add $1299

DELL™ PRECISION™ 330

Advanced Performance Workstation

- Intel® Pentium® 4 Processor at 1.4GHz (up to 1.8GHz)
- Desktop Chassis in Midnight Gray
- Single Processor/RAID Capable
- 128MB PC800 RDRAM (up to 2GB)
- 20GB[5] (7200 RPM) EIDE HD (up to 73.4GB[5] 10K RPM SCSI)
- NVIDIA® TNT2 Pro 16MB 4X AGP Graphics Card
- Integrated NIC & Sound ■ 48X Max CD-ROM
- MS® Windows® 2000 Professional
- 3-Yr NBD On-Site Service[4]
- 7x24 Dedicated Workstation Phone Tech Support

$1199 E•VALUE CODE 05031-490811

BUSINESS LEASE: $33/MO., 48 MOS.[11]

- Monitor Sold as an Upgrade

Dell computers are available pre-loaded with Microsoft Windows 2000 Professional, which is over 13 times more reliable[43] and up to 30 percent faster[40] than Windows 98. Add MS Windows 2000 to your Dimension desktop or Inspiron notebook for $99.

intel inside pentium 4

FAST. POWERFUL. AFFORDABLE.

And did we mention it's easy to purchase, easy to set up and good-looking to boot? Meet the Dell™ Dimension™ 8100 with an incredibly quick Intel® Pentium® 4 processor that delivers performance where you need it most. It also provides you with up to 1.7GHz of speed and dual-channel RDRAM with memory up to 2GB[5]. All packaged in a sleek new design at an affordable price. Now's the time for you to do something fast.

DELL™ DIMENSION™ 8100 Series

Cutting-Edge Business Desktop

- NEW Intel® Pentium® 4 Processor at 1.3GHz
- 128MB RDRAM (up to 2GB)
- 20GB[5] Value HD
- 15" (13.8" vis) E551 Monitor
- 32MB NVIDIA® GeForce2 MX 4X AGP Graphics
- 48X Max CD-ROM
- Integrated 3Com® 10/100 NIC
- MS® Windows® Me & MS® Works Suite 2001 & Norton® AntiVirus™
- 1-Yr Ltd Warranty[2] ■ 1-Yr NBD On-Site Service[4]

$999 E·VALUE CODE 05030-590809

BUSINESS LEASE: $28/MO., 48 MOS.[11]

- MS® Windows® 2000 Professional, add $99
- 3-Yr NBD On-Site Service[4], add $119
- Lexmark™ E312L Laser Printer, add $269

DELL™ DIMENSION™ 8100 Series

Cutting-Edge Home Desktop

- NEW Intel® Pentium® 4 Processor at 1.4GHz
- 128MB RDRAM (up to 2GB)
- 40GB[5] (7200 RPM) Ultra ATA/100 HD
- 17" (16.0" vis) E770 Monitor
- 32MB NVIDIA® GeForce2 MX 4X AGP Graphics
- 16X Max DVD-ROM
- Sound Blaster® 64V PCI Sound Card
- Harman Kardon® HK-195 Speakers
- 56K Capable[6] PCI Telephony Modem
- MS® Windows® Me ■ MS® Works Suite 2001
- 1-Yr Ltd Warranty[2] ■ 1-Yr NBD On-Site Service[4]
- 6 Months of DellNet™ by MSN® Internet Access[10] Included

$1299 E·VALUE CODE 05030-500812b

ASK US ABOUT NO PAYMENTS FOR 90 DAYS.

- 3-Yr NBD On-Site Service[4], add $119

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